Miller
The Power of Blue.

OM-485 181 594F
November 1997

Processes

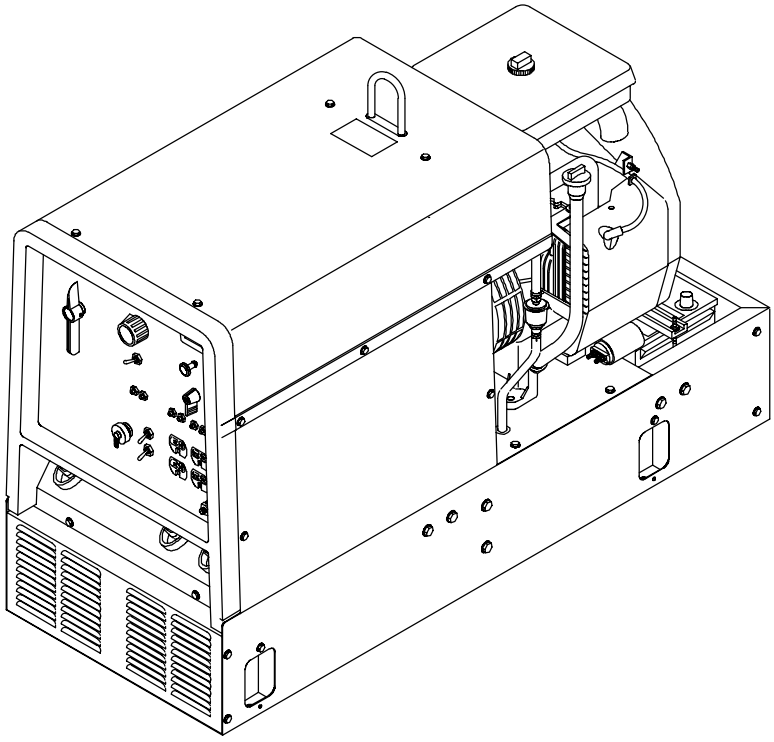
MIG (GMAW) Welding
Flux Cored (FCAW)
Stick (SMAW) Welding
TIG (GTAW) Welding

Description

CC CV AC DC

Engine Driven Welding Generator

Trailblazer® 251



OWNER'S MANUAL

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

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The Power of Blue.

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⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The following terms are used interchangeably throughout this manual:
MIG = GMAW, Wire Welding
TIG = GTAW
Stick = SMAW

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous.

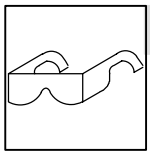
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

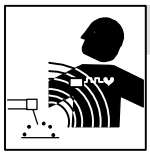
HOT PARTS can cause severe burns.

- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

1-3. Engine Hazards

FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank – allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.

STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- If the engine is warm and checking is needed, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

MOVING PARTS can cause injury.

- Keep away from fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall panels or guards and close doors when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

BATTERY EXPLOSION can BLIND.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles.
- Observe correct polarity (+ and –) on batteries.
- Disconnect negative (–) cable first and connect it last.

BATTERY ACID can BURN SKIN and EYES.

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

ENGINE EXHAUST GASES can kill.

- Use equipment outside in open, well-ventilated areas.
- If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE HEAT can cause fire.

- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

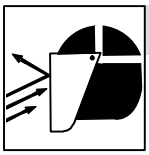
EXHAUST SPARKS can cause fire.

- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas – see applicable codes.

1-4. Additional Symbols For Installation, Operation, And Maintenance

FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, trailer, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

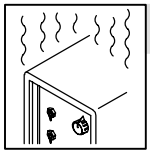


FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

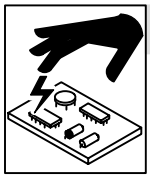
OVERHEATING can damage motors.

- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.



OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

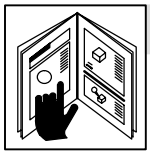


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

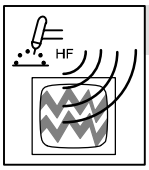
TILTING OF TRAILER can cause injury.

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.



READ INSTRUCTIONS.

- Use only genuine MILLER replacement parts.
- Perform engine maintenance and service according to this manual and the engine manual.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-5. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-5. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (laine ou cuir) et une protection des pieds.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

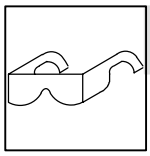
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'interieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et

tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

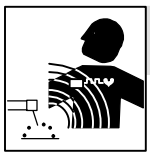
DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Prévoir une période de refroidissement avant d'effectuer des travaux d'entretien.
- Porter des gants et des vêtements de protection pour travailler sur un moteur chaud.
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publication P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers existant en relation avec le moteur

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant :
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas approcher les mains des ventilateurs, courroies et autres pièces en mouvement.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (–) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les panneaux ou les dipositifs de protection et fermer les portes à la fin des travaux d'entretien et avant de faire démarrer le moteur.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.

L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher les câbles de batterie.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser le poste de soudage pour charger les batteries ou des véhicules de démarrage rapide.
- Observer la polarité correcte (+ et –) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.

L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.

LES GAZ D'ÈCHAPPEMENT DU MOTEUR peuvent provoquer des accidents mortels.

- Utiliser l'équipement à l'extérieur dans des zones ouvertes et bien ventilées.
- En cas d'utilisation dans un endroit fermé évacuer les gaz d'échappement du moteur vers l'extérieur à distance des entrées d'air dans les bâtiments.

LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

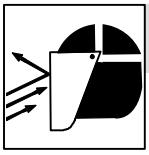
LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

1-4. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.

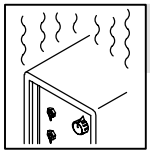


LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affuterr l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manoeuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.

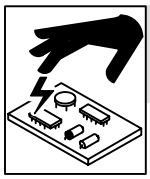
LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.

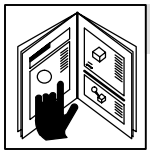


LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

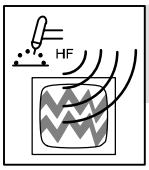
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



LIRE LES INSTRUCTIONS.

- Utiliser uniquement des pièces de rechange MILLER.
- Effecteur la maintenance et la mise en service d'après le manuel et celui du moteur.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

1-5. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

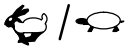
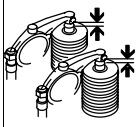
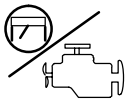
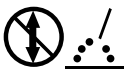
5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

SECTION 2 – DEFINITIONS

2-1. Symbol Definitions

Stop Engine	Fast (Run, Weld/Power)	 Fast/Slow (Run/Idle)	Slow (Idle)
Start Engine	Panel/Local	Temperature	Fuel
Engine Oil	On	 Check Valve Clearance	Battery (Engine)
 Engine	Read Operator's Manual	**A** Amperes	**V** Volts
MIG (GMAW), Wire	Stick (SMAW)	TIG (GTAW)	Circuit Breaker
Positive	Negative	Alternating Current (AC)	Output
Time	**h** Hours	**s** Seconds	Protective Earth (Ground)
 Do not switch while welding	**14** Remote 14 Receptacle	Work Connection	Engine Choke
Wire Feed	Electrode Positive	Electrode Negative	

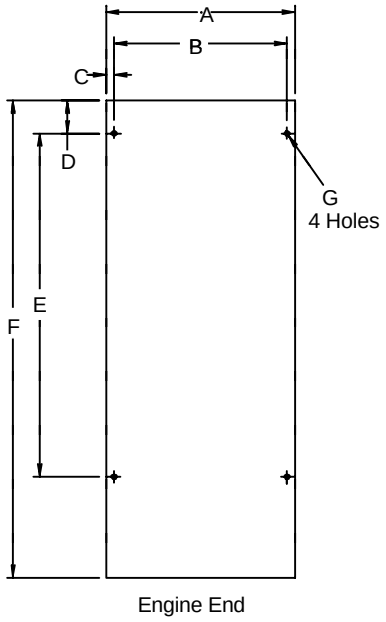
SECTION 3 – SPECIFICATIONS

3-1. Weld, Power, And Engine Specifications

Welding Mode	Rated Welding Output	Maximum Open-Circuit Voltage	Amperage Range In CC Mode	Voltage Range In CV Mode	Auxiliary Power Rating	Fuel Capacity	Engine
CC/AC	200 A, 25 V, 60% Duty Cycle	75	40 – 200 A	10 – 45 V	Single-Phase, 4 kVA/kW, 33/16.5 A, 120/240 V AC, 60 Hz	8.5 gal (32 L) Tank	Onan P220 Air-Cooled, Two-Cylinder, Four-Cycle, 20 HP Gasoline Engine
CC/DC	250 A, 25 V, 100% Duty Cycle	80	40 – 250 A				
CV/DC	250 A, 25 V, 100% Duty Cycle	50	– –				

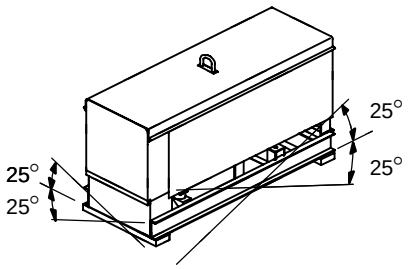
3-2. Dimensions, Weights, And Operating Angles

Dimensions	
Height	31 in (787 mm)
Width	18-3/4 in (476 mm)
Depth	46 in (1164 mm)
A	18 in (457 mm)
B	16-1/2 in (419 mm)
C	3/4 in (19 mm)
D	3-1/8 in (79 mm)
E	32-3/4 in (832 mm)
F	45-1/2 in (1156 mm)
G	13/32 in (10 mm) Dia.
Weight	
532 lb (241 kg)	



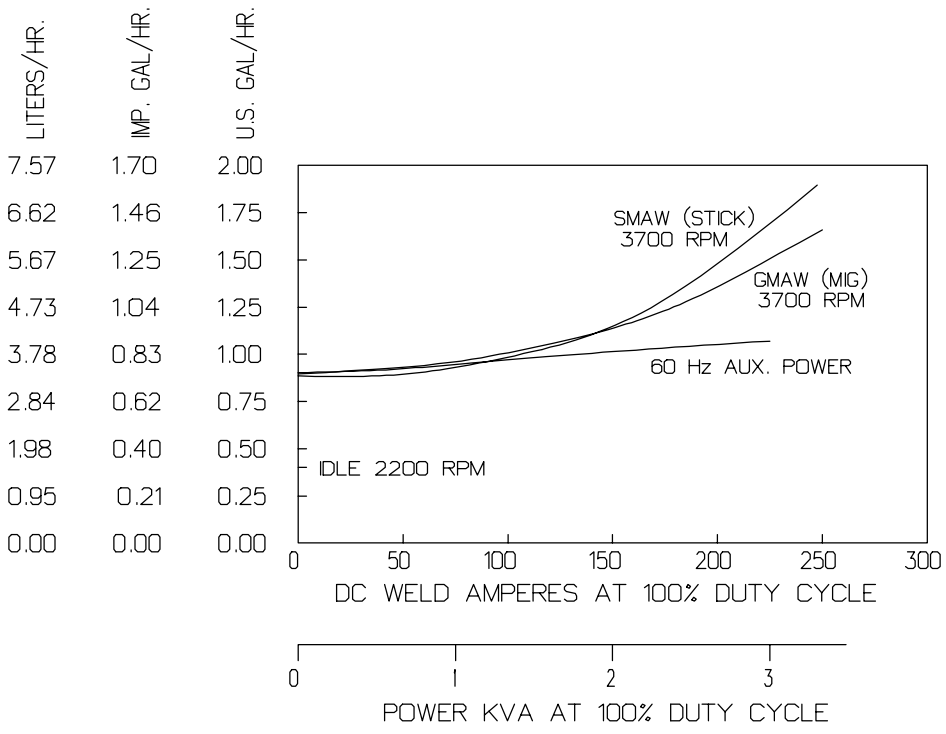
▲ **Do not exceed operating angles while running or engine damage will occur.**

▲ **Do not move or operate unit where it could tip.**



ST-800 426

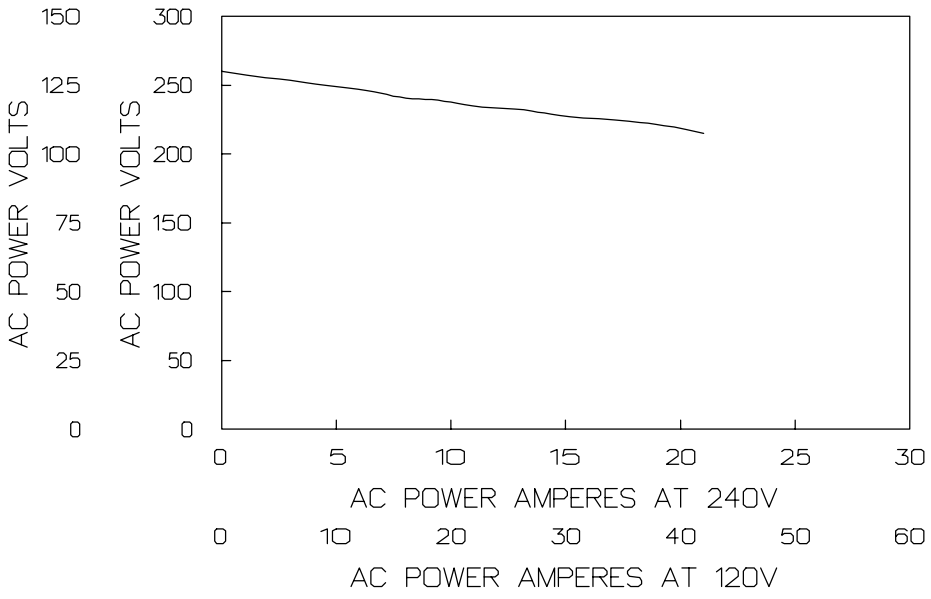
3-3. Fuel Consumption



ST-182 297

3-4. Auxiliary Power Curve

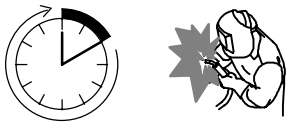
The ac auxiliary power curve shows the auxiliary power available in amperes at the receptacles.



SA-183 654

3-5. Duty Cycle

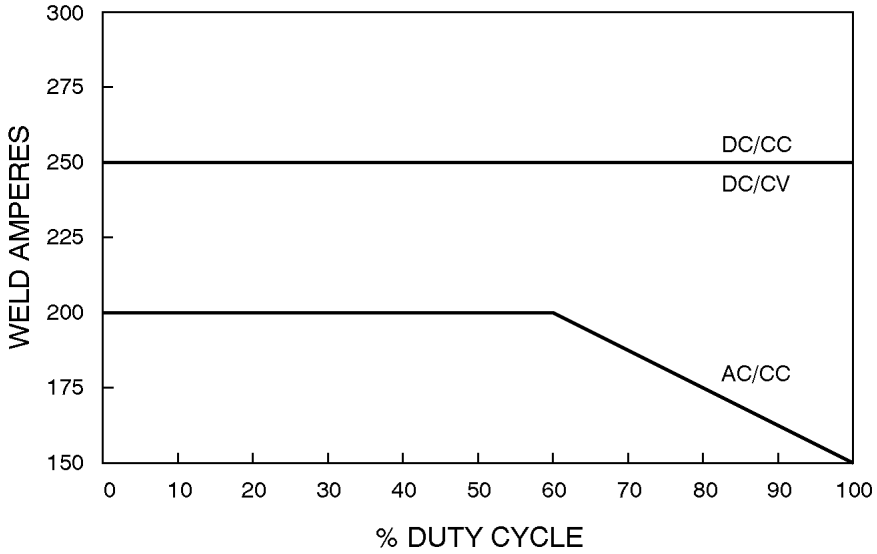
100% Duty Cycle at 250 Amperes DC



Continuous Welding

Duty cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

▲ **Exceeding duty cycle can damage unit and void warranty.**

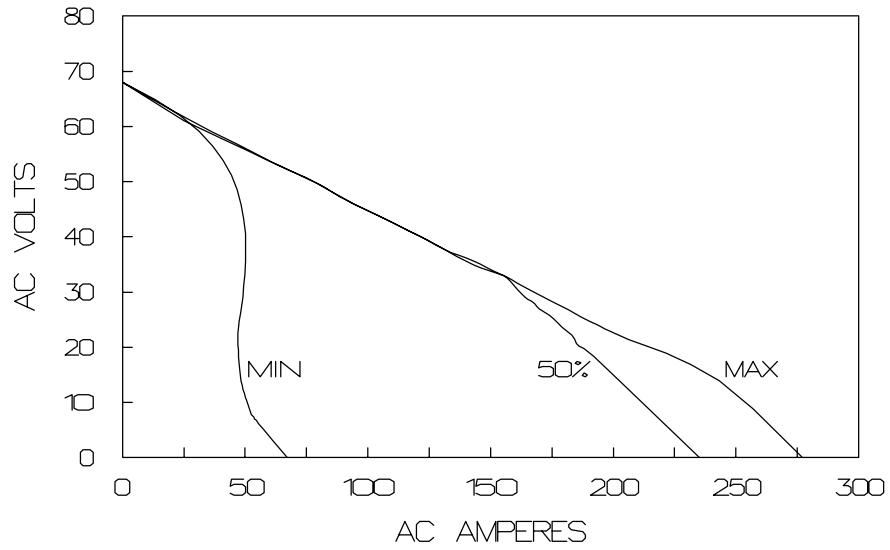


ST-182 298

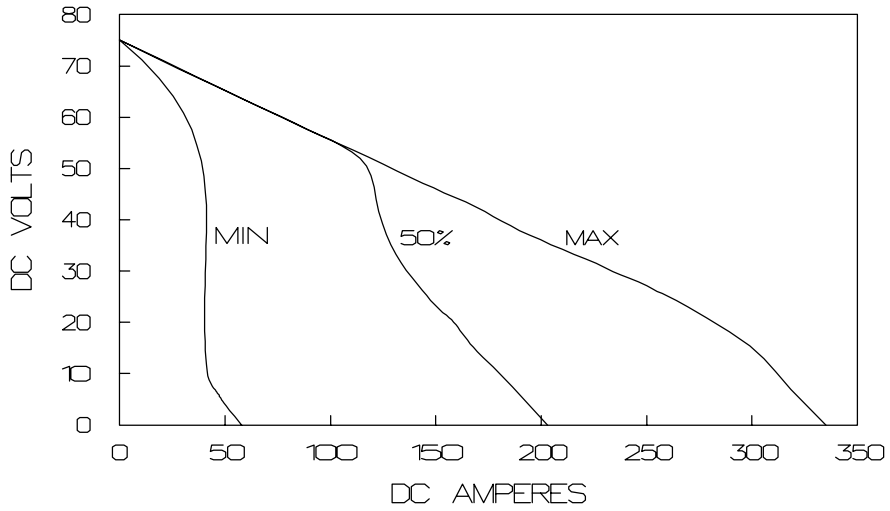
3-6. Volt-Ampere Curves

The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of other settings fall between the curves shown.

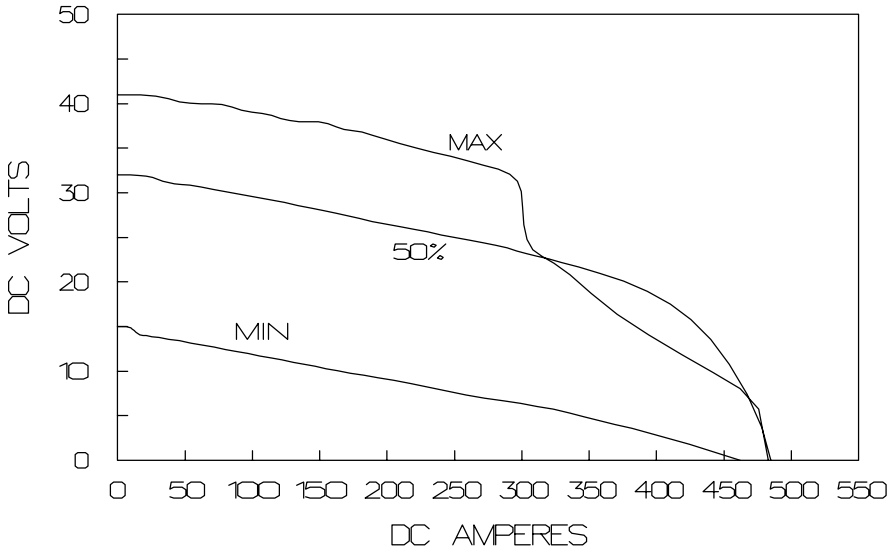
A. CC/AC Mode



B. CC/DC Mode



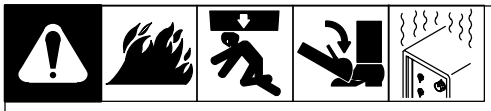
C. CV/DC Mode



SA-183 653-A / SA-183 652-A / SA-183 651-A

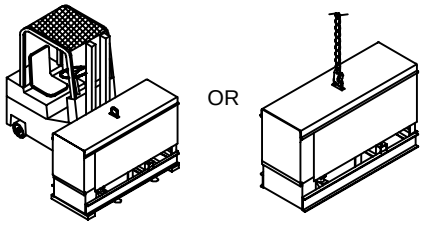
SECTION 4 – INSTALLATION

4-1. Installing Welding Generator

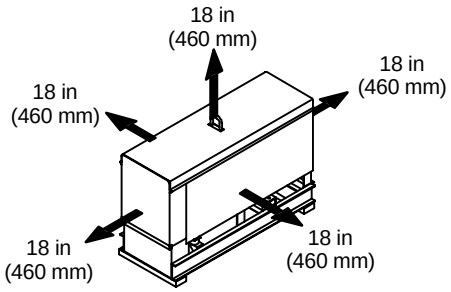


Movement

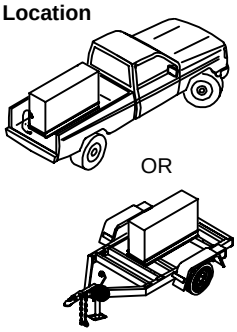
▲ **Do not lift unit from end.**



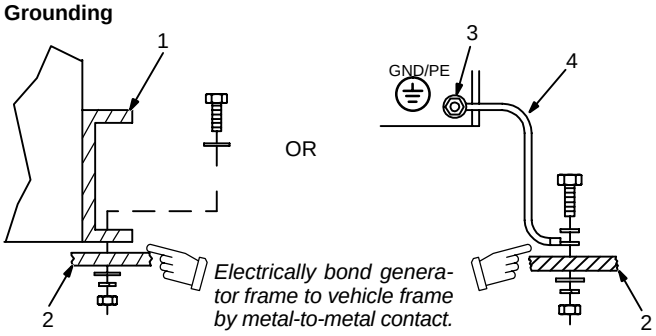
Airflow Clearance



Location



Grounding



Electrically bond generator frame to vehicle frame by metal-to-metal contact.

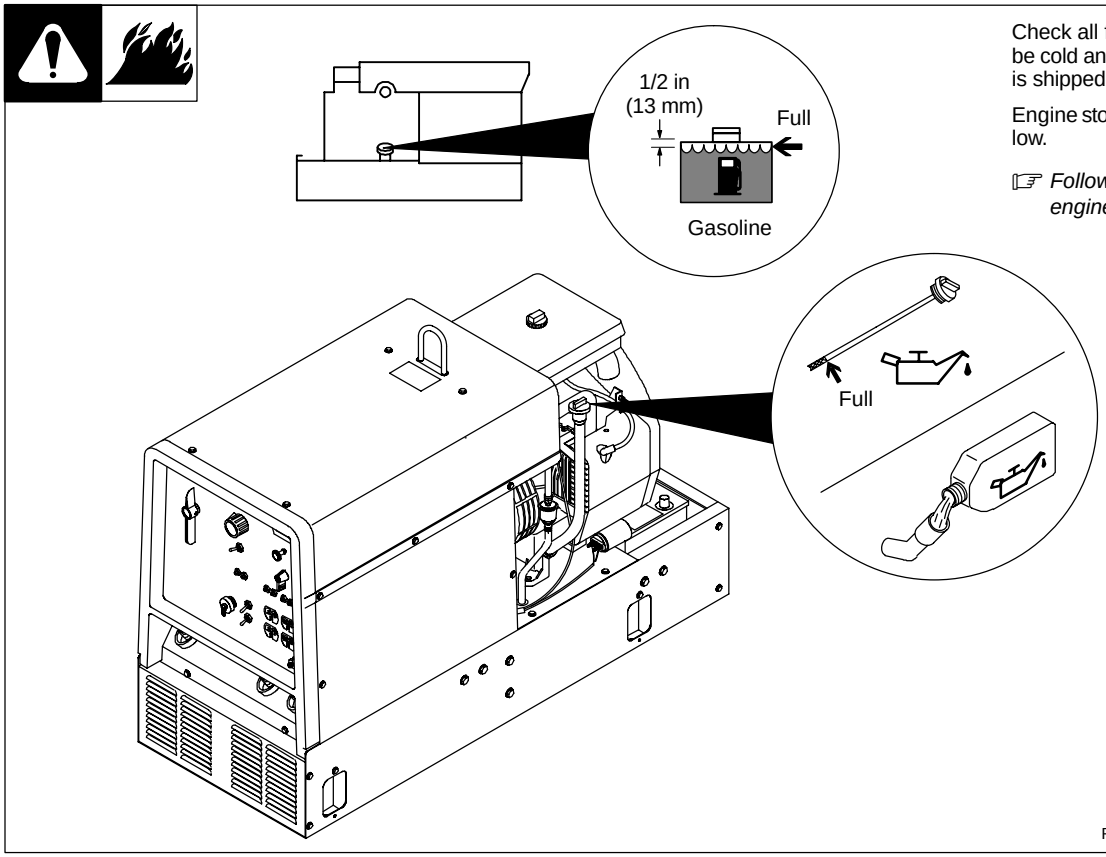
1 Generator Base
2 Metal Vehicle Frame
3 Equipment Grounding Terminal
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

install1 1/97 – Ref. ST-800 652 / Ref. ST-800 477-A / ST-158 936-A / S-0854

4-2. Engine Prestart Checks



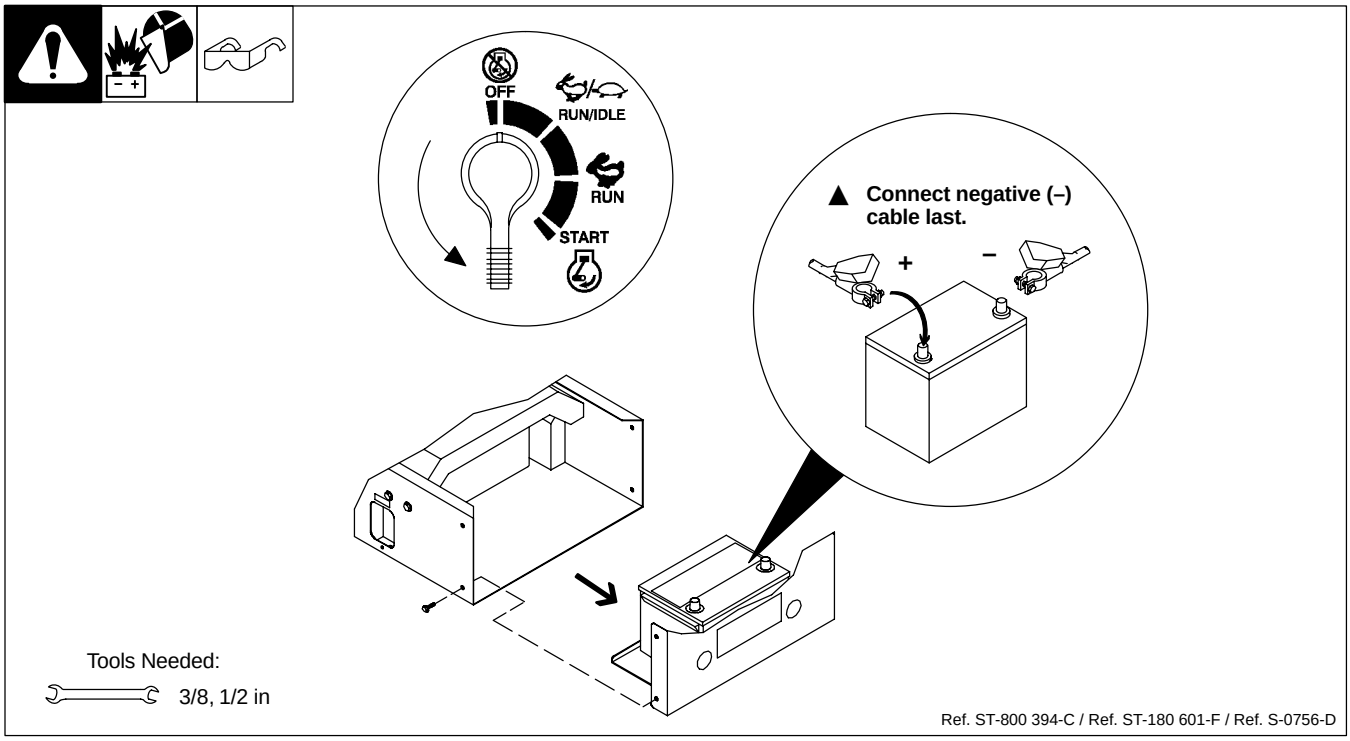
Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W30 engine oil.

Engine stops if oil pressure gets too low.

☞ *Follow run-in procedure in engine manual.*

Ref. ST-151 983 / ST-801 532-B

4-3. Connecting The Battery

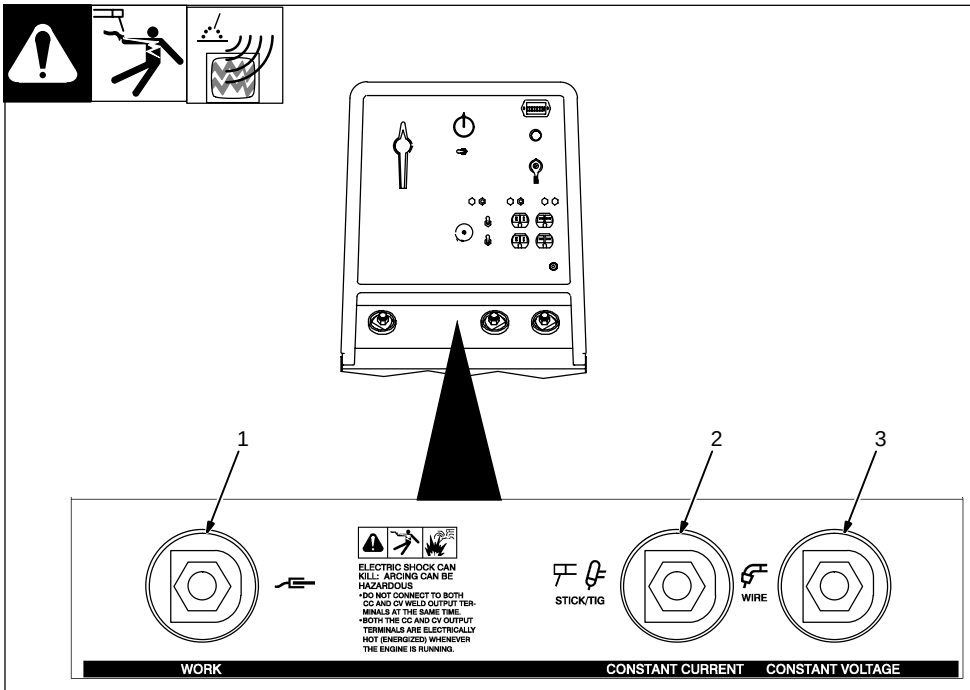


Tools Needed:

3/8, 1/2 in

Ref. ST-800 394-C / Ref. ST-180 601-F / Ref. S-0756-D

4-4. Connecting To Weld Output Terminals


1
2
3
ELECTRIC SHOCK CAN KILL: ARCING CAN BE HAZARDOUS
•DO NOT CONNECT TO BOTH CC AND CV WELD OUTPUT TERMINALS AT THE SAME TIME.
•BOTH THE CC AND CV OUTPUT TERMINALS ARE ELECTRICALLY HOT (ENERGIZED) WHENEVER THE ENGINE IS RUNNING.
STICK/TIG
WIRE
WORK
CONSTANT CURRENT
CONSTANT VOLTAGE

▲ **Do not connect to CC and CV terminals at the same time.**

1 Work Weld Output Terminal

2 Stick/TIG (CC) Weld Output Terminal

3 Wire (CV) Weld Output Terminal

For MIG welding, connect work cable to Work terminal and wire feeder cable to Wire (CV) terminal.

For Stick/TIG welding, connect work cable to Work terminal and electrode holder cable to Stick/TIG (CC) terminal.

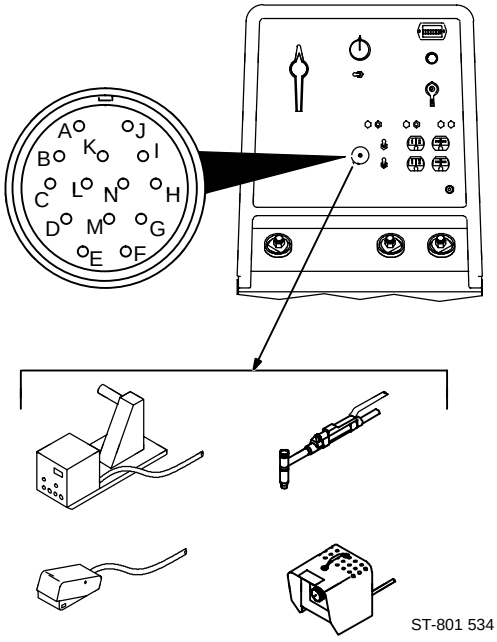
ST-801 534 / Ref. ST-180 601-F

4-5. Selecting Weld Cable Sizes

Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0

*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. Contact your distributor for the mm^2 equivalent weld cable sizes. S-0007-E

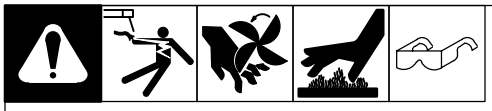
4-6. Remote 14 Receptacle Information

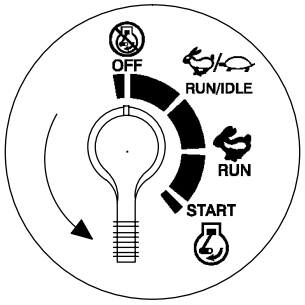


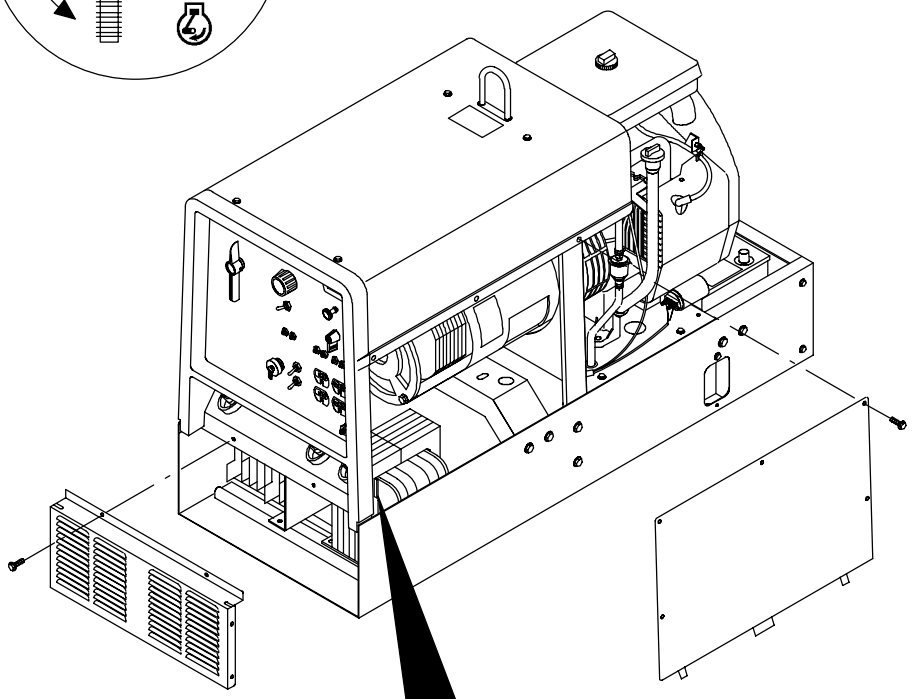
ST-801 534

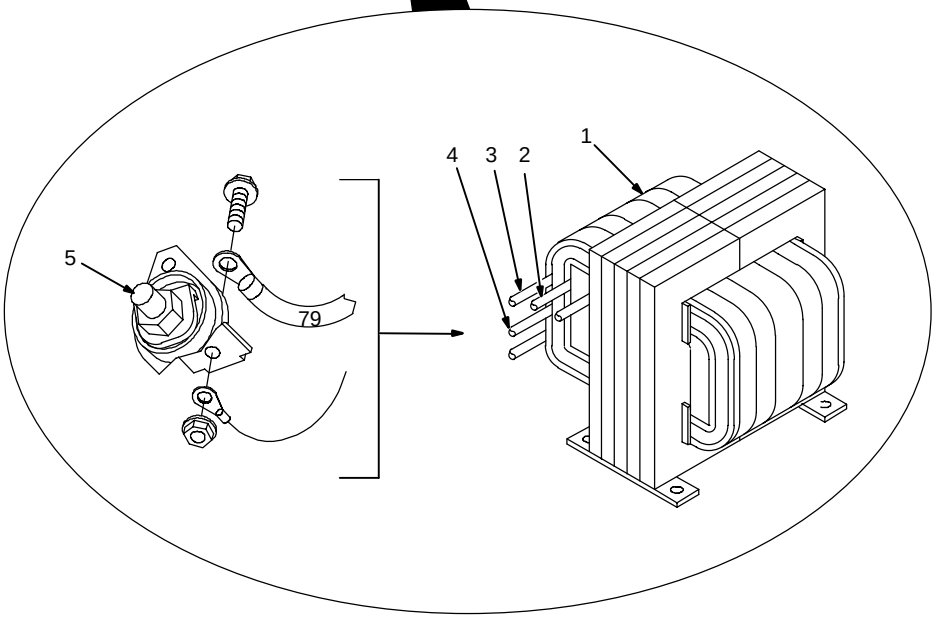
REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts ac.
	B	Contact closure to A completes 24 volt ac contactor control circuit.
115 VOLTS AC OUTPUT (CONTACTOR)	I	115 volts ac.
	J	Contact closure to I completes 115 volt ac contactor control circuit.
A/V AMPERAGE VOLTAGE	C	0 to +10 volts dc output to remote control.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control.
GND	G	Circuit common for 24 and 115 volt ac circuits.
	K	Chassis common.
*The remaining sockets are not used.		

4-7. Adjusting MIG Weld Puddle Consistency









▲ **Stop engine.**

Stabilizer DC-Z is factory connected to suit most MIG (Wire Welding) applications.

To change MIG weld puddle consistency, proceed as follows:

Remove lower front panel and side panel.

Starting from center of DC-Z, the three leads 79 will be referred to as inner, middle, and outer.

1 Stabilizer DC-Z

2 Inner Lead 79

3 Middle Lead 79

4 Outer Lead 79

5 Wire (CV) Weld Output Terminal

Middle lead 79 is connected to Wire (CV) weld terminal at the factory. Disconnect middle lead 79 from terminal.

To wet out weld puddle:

Remove insulation sleeve from inner lead 79. Connect inner lead 79 to Wire (CV) terminal, reusing hardware.

To stiffen weld puddle:

Remove insulation sleeve from outer lead 79. Connect outer lead 79 to Wire (CV) terminal, reusing hardware.

Slide sleeves over unused leads 79, and secure with cable ties. Reinstall panels.

Tools Needed:

3/8, 7/16 in

ST-801 537-B / Ref. ST-180 601-F

SECTION 5 – OPERATING WELDING GENERATOR

5-1. Front Panel Controls

1 DC Polarity/AC Switch

Use switch to select AC weld output or polarity of DC weld output.

▲ **Do not switch under load.**

2 Process Select Switch

Use switch to select output for weld process.

▲ **Do not switch under load.**

3 A/V Control

Use control to select weld voltage or amperage. Control may be adjusted while welding.

4 Engine Control Switch

Use switch to start engine, select speed, and stop engine. In Run/Idle position, engine runs at idle speed at no load, and weld/power speed under load. In Run position, engine runs at weld/power speed.

☞ *Place switch in Run position to operate most GMAW equipment.*

5 Engine Choke Control

Use control to change engine air-fuel mix.

To Start: pull out choke and turn Engine Control switch to Start position. Release switch and slowly push choke in when engine starts. Do not crank engine while engine is still turning.

To Stop: turn Engine Control switch to Off position.

6 Engine Hour Meter

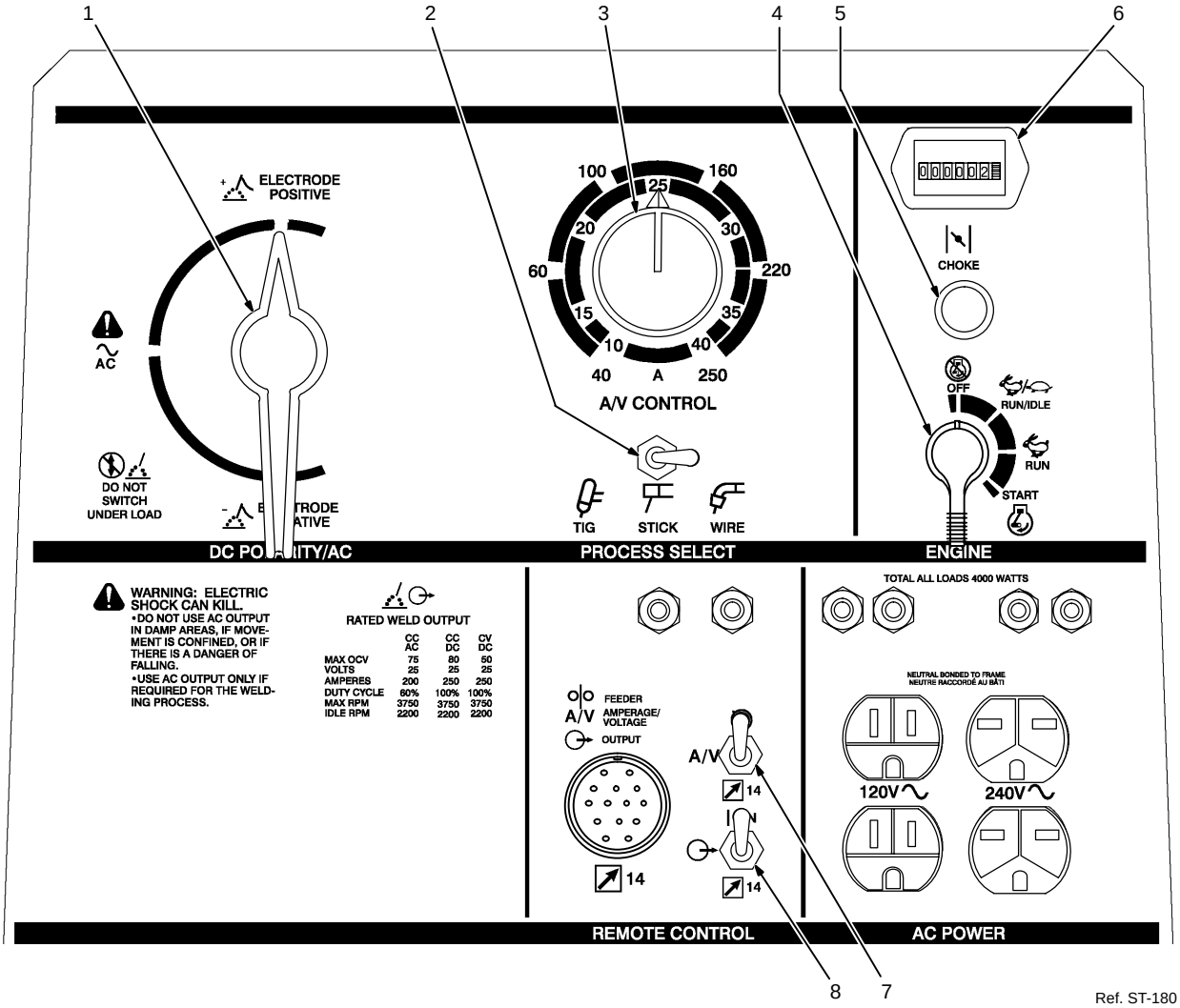
7 Remote Amperage/Voltage Switch

Use switch to select front panel or remote amperage/voltage control (see Section 5-2).

8 Output (Contactor) Switch

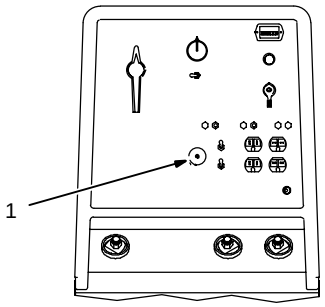
Use switch to control remote contactor if connected to remote 14 receptacle RC1 (see Section 5-2).

▲ **Weld output terminals are energized when Output (Contactor) switch is On and engine is running.**



Ref. ST-180 601-F

5-2. Remote Amperage/Voltage Control



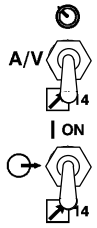
1 Remote 14 Receptacle RC1

Connect optional remote control to RC1 (see Section 4-6).

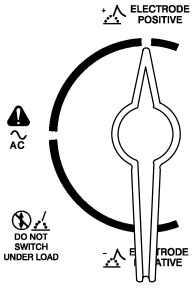
2 Remote Hand Control (Optional)

3 Remote Foot Control (Optional)

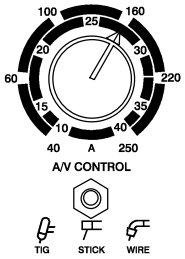
In Example:
Process = Stick (SMAW)
Min = 40 A CC/DC
Max = 160 A CC/DC



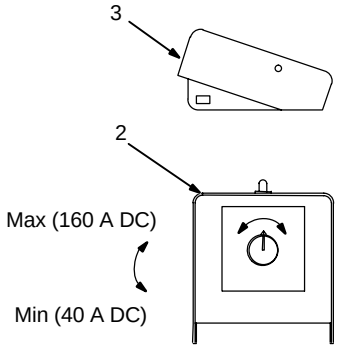
Set Remote Control Switches



Set Polarity Switch



Set Process and A/V Control

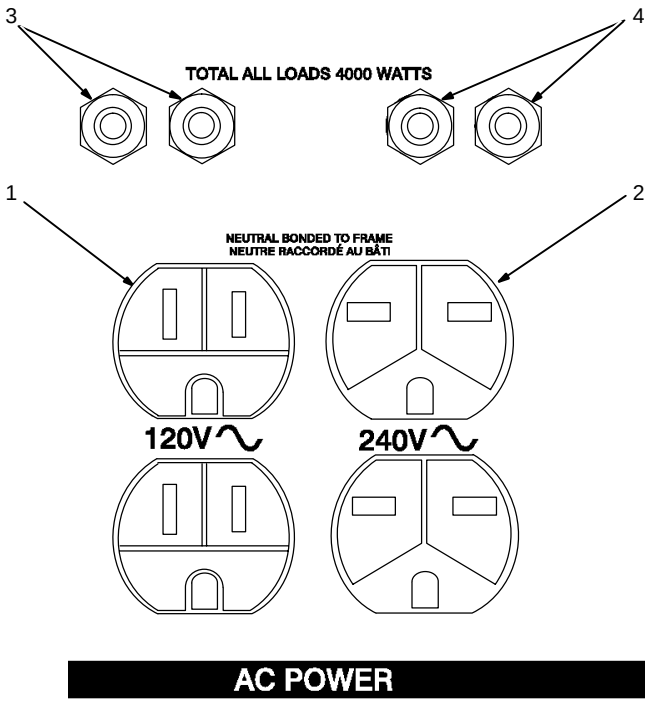


Adjust Remote Control (Stick Welding Only)

ST-801 534 / ST-180 601-F / S-0769 / S-0774

SECTION 6 – OPERATING AUXILIARY EQUIPMENT

6-1. Auxiliary Power Receptacles And Circuit Breakers



AC POWER

▲ **Use GFCI-protected extension cords.**

1 120 V 15 A AC Duplex Receptacle RC1

2 240 V 15 A AC Duplex Receptacle RC2

RC1 and RC2 supply 60 Hz single-phase power at weld/power speed. Maximum output from RC1 is 3.6 kVA/kW. Maximum output from RC2 is 4.0 kVA/kW.

3 Circuit Breakers CB3 And CB4

CB3 and CB4 protect RC1 from overload. If CB3 or CB4 opens, half of RC1 does not work. Press button to reset breaker.

4 Circuit Breaker CB5 And CB6

CB5 and CB6 protect RC2 from overload. If CB5 or CB6 opens, RC2 does not work. 120 volts may still be present at RC2.

☞ *If a circuit breaker continues to open, contact Factory Authorized Service Agent.*

Combined output of all receptacles limited to 4 kVA/kW output of the generator.

EXAMPLE: If 15 A is drawn from RC1, only 9 A is available at RC2:

(120 V x 15 A) + (240 V x 9 A) = 4.0 kVA/kW

5 Auxiliary Power While Welding Label

5

SIMULTANEOUS WELDING AND POWER

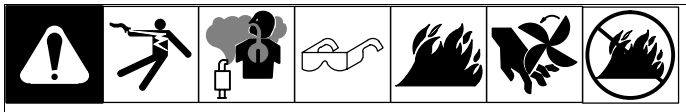
Weld Current CV/CC	Watts	Current In Amperes	
		120V	240V
250	2200	18.5	9
225	2750	23	11.5
200	3250	27	13.5
150	3300	27.5	14
100	3800	32	16
50	4000	33.3	16.7
0	4000	33.3	16.7

See Owner's Manual for additional information. S-135 048-B

Ref. ST-180 601-F

SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. Routine Maintenance



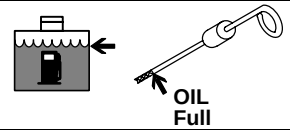
Recycle engine fluids.

▲ **Stop engine before maintaining.**

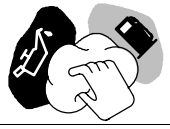
☞ *See also Engine Manual and maintenance label. Service engine more often if used in severe conditions.*

8 h

Check fluid levels. See Section 4-2.

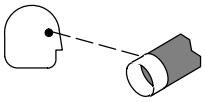


Wipe up spills.



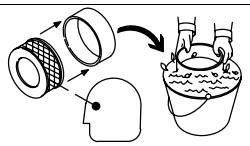
20 h

Check and clean spark arrestor screen. See Section 7-4.



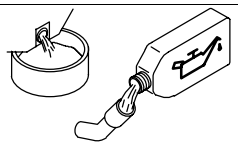
25 h

Service air filter wrapper (foam element). See Section 7-3.

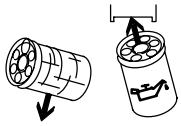


50 h

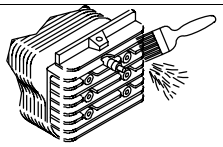
Change oil. See Section 7-5 and maintenance label.



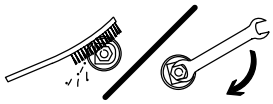
Change oil filter. See Section 7-5 and maintenance label.



Clean cooling system. See engine manual.

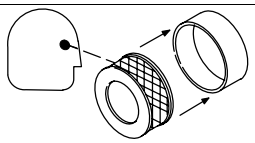


Clean and tighten weld terminals.

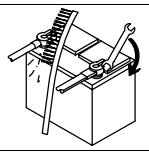


100 h

Service air filter element. See Section 7-3.

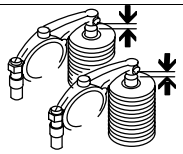


Clean and tighten battery connections.

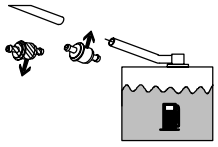


200 h

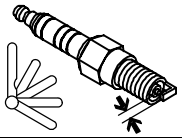
Check valve clearance.



Replace fuel filter. See Section 7-5.



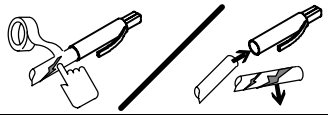
Check spark plugs.



Replace unreadable labels.

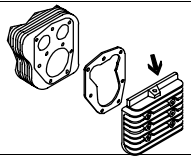
500 h

Repair or replace cracked cables.

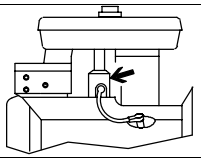


1000 h

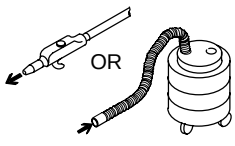
Remove cylinder head deposits.



Clean crankcase breather valve.



Blow out or vacuum inside. During heavy service, clean monthly.



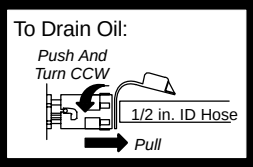
7-2. Maintenance Label

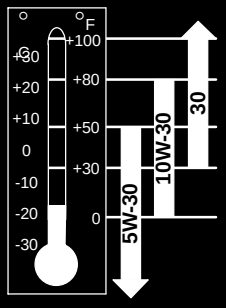
ONAN P216/P220 GAS ENGINE

See Engine Manual for complete engine care. Give engine Specification and Serial Number when ordering parts.

Check daily.

To Drain Oil:





Recommended Oil . . . API Service Classification SF/CC, SG/CE, SH

Oil & Filter Change . . . . . CONDITIONS

	Normal	Severe
P216	100 hours	50 hours
P220	50 hours	50 hours

Oil Filter . . . . . MILLER 065 251, Onan 122-0645

Oil Capacity . . . . . 1.5 qt (1.4 L) or 1.75 qt (1.6 L) with filter change

Gasoline

Fuel Grade . . . . . Regular or Unleaded

Fuel Filter . . . . . MILLER 066 113, Onan 149-2206-01, Fram G10E1

Air Filter Service . . . . . 100 hours or less – see Owner's Manual

Air Filter Element . . . . MILLER 064 617, Onan 140-2628-01

Air Filter Wrapper . . . . MILLER 065 653, Onan 140-1496

12 Volt Battery . . . . . BCI Group 58

Cranking Performance at 0°F (-18°C) . . . . 430 Amps min.

Engine RPM – No Load

Weld/

Power 3700

Idle 2200

Valve Clearance – Cold

In. . . . 0.005 in (0.13 mm)

Ex. . . 0.013 in (0.33 mm)

Spark Plug Gap . . . . . 0.025 in. (0.6 mm)

Spark Plug . . . . . Champion RS17YX Preferred or RS14YC

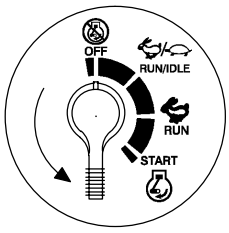
Use only resistor spark plugs and wires.

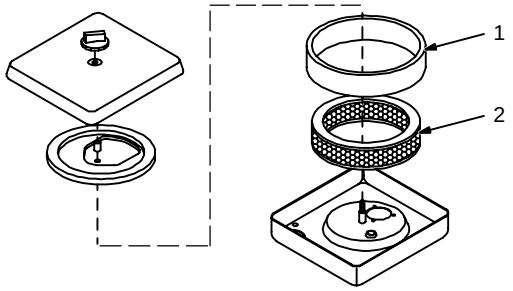
Optional

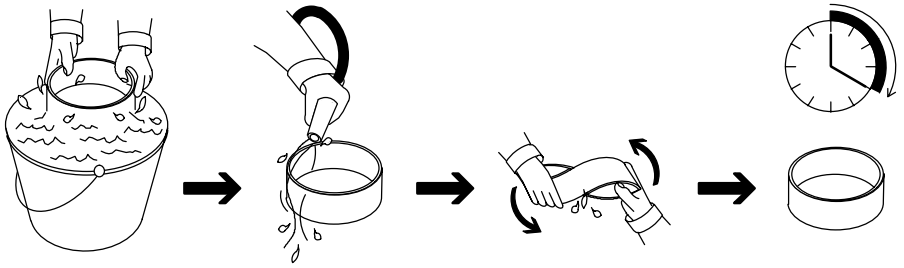
Spark Arrestor Inspection And Service . . 20 operating hours - see Owner's Manual

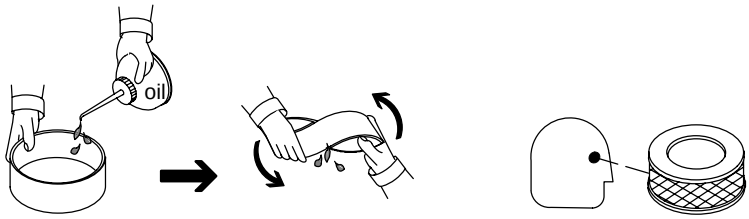
S-165 623-E

7-3. Servicing Air Cleaner









▲ **Stop engine.**

▲ **Do not run engine without air cleaner or with dirty element.**

1 Wrapper (Foam Element)

Wash wrapper with soap and water solution. Allow wrapper to air dry completely.

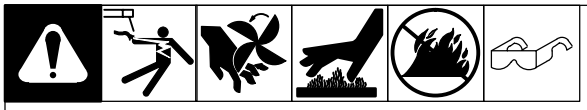
Spread 1 tablespoon SAE 30 oil evenly into wrapper. Squeeze out excess oil.

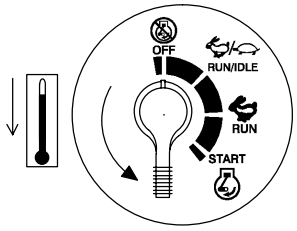
2 Element

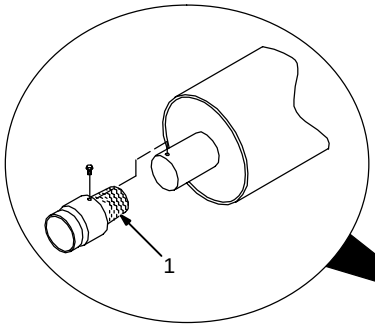
Replace element if damaged, dirty, or oily.

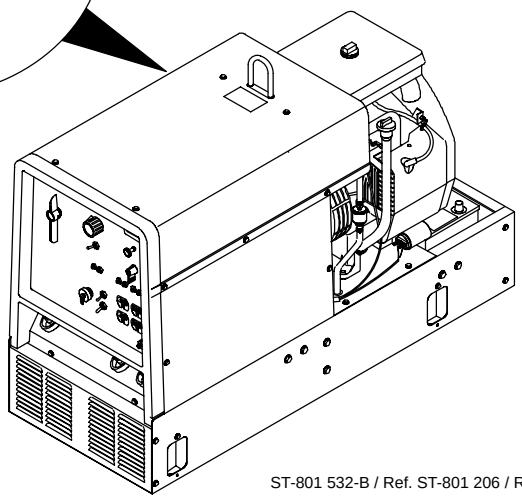
aircleaner3 1/97 – ST-156 852 / Ref. ST-180 601-F / S-0759

7-4. Servicing Optional Spark Arrestor

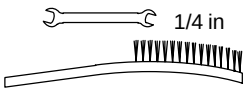








Tools Needed:



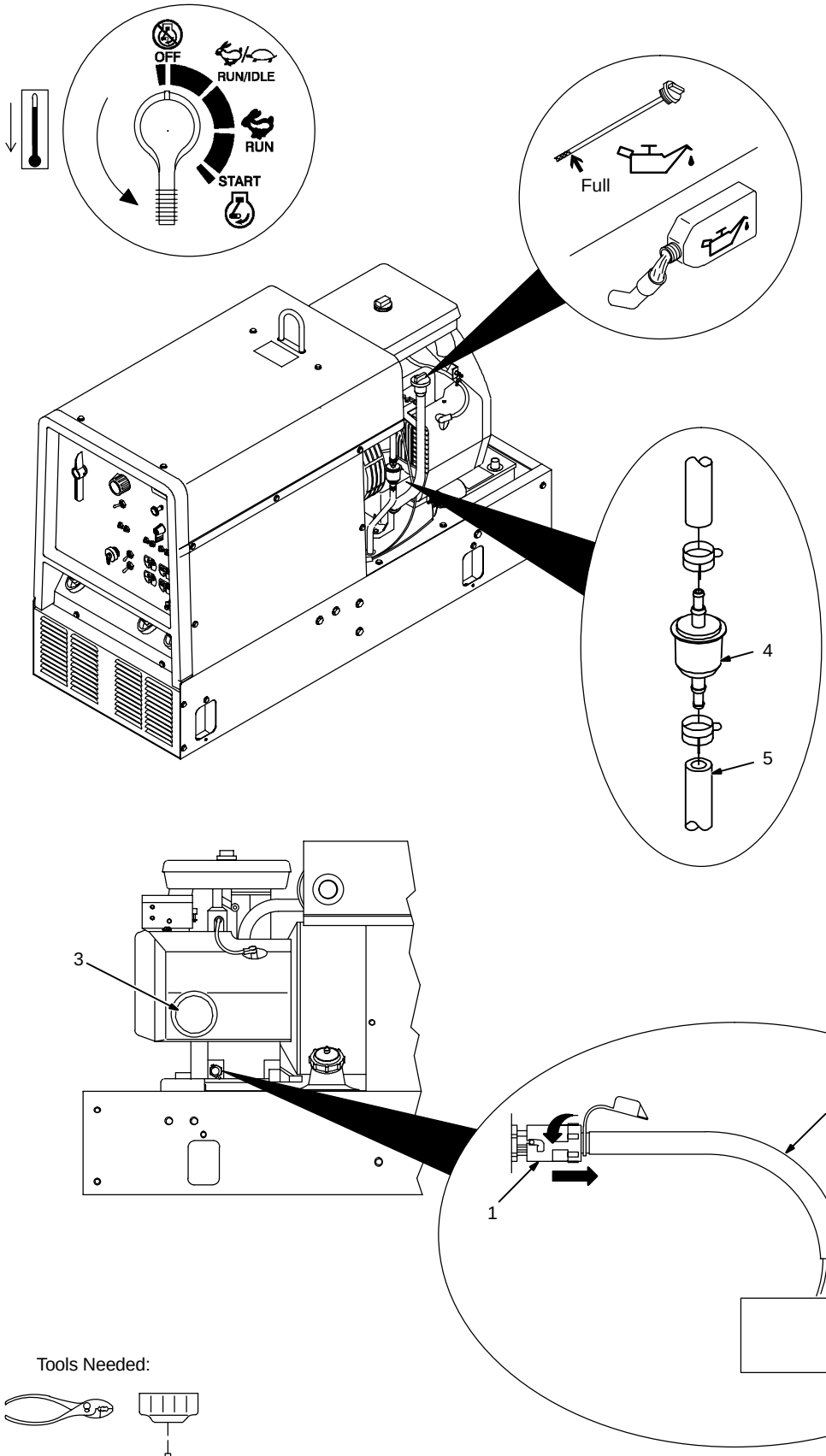
▲ **Stop engine and let cool.**

1 Spark Arrestor Screen

Clean and inspect screen. Replace spark arrestor if screen wires are broken or missing.

ST-801 532-B / Ref. ST-801 206 / Ref. ST-180 601-F

7-5. Changing Engine Oil, Oil Filter, And Fuel Filter



▲ **Stop engine and let cool.**

1 Oil Drain Valve

2 1/2 ID x 12 in Hose

3 Oil Filter

Change engine oil and filter according to engine manual.

▲ **Close valve and valve cap before adding oil and running engine.**

Fill crankcase with new oil to full mark on dipstick (see Section 7-2).

4 Fuel Filter

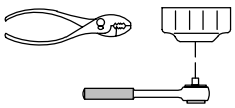
5 Fuel Line

Replace line if cracked or worn. Install new filter. Wipe up any spilled fuel.

Start engine, and check for fuel leaks.

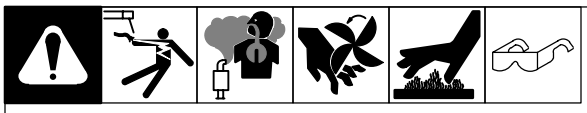
▲ **Stop engine, tighten connections as necessary, and wipe up fuel.**

Tools Needed:

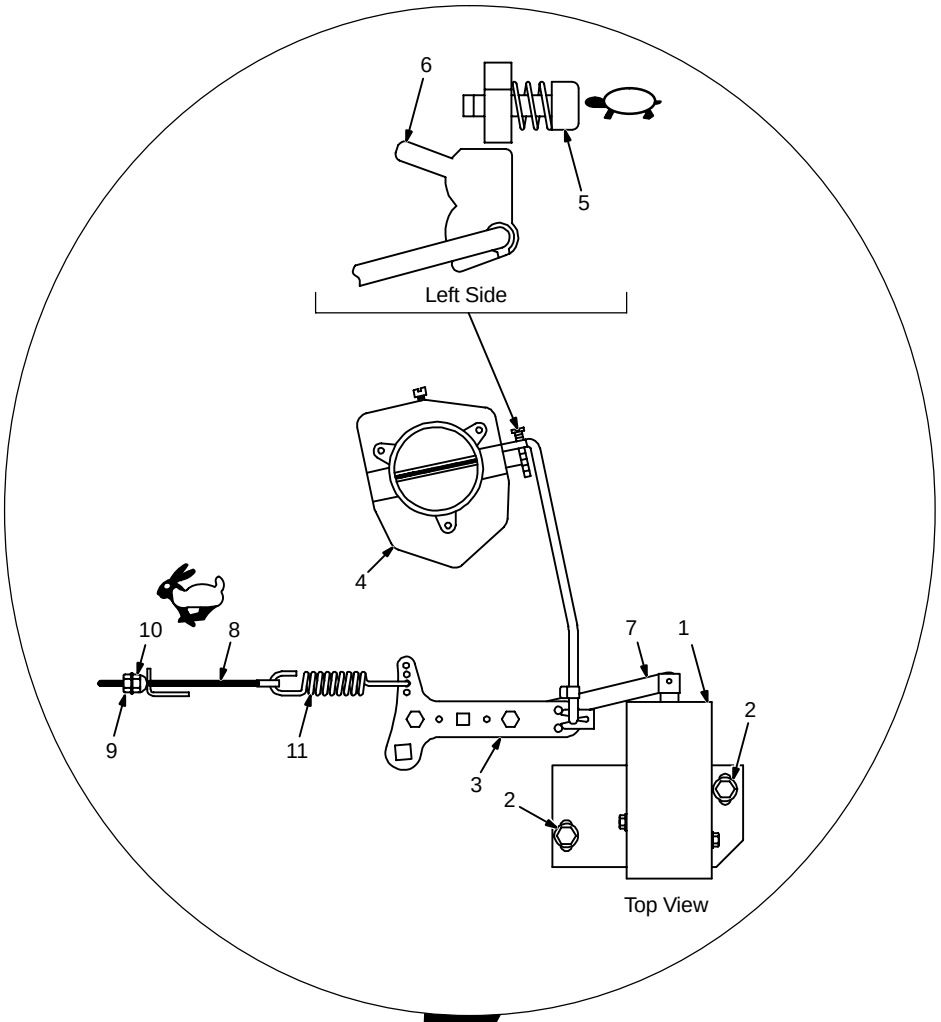


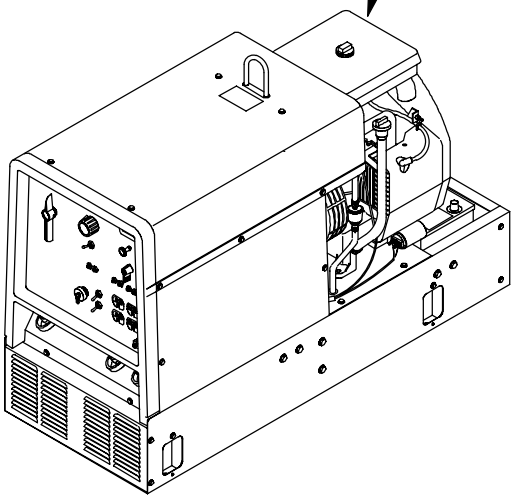
Ref. ST-801 532-B / ST-800 395-A / Ref. ST-180 601-F / S-0842

7-6. Adjusting Engine Speed



	2200 ± 100 rpm
	3700 ± 50 rpm





Tools Needed:

1/4, 3/8 in

After tuning engine, check engine speeds with a tachometer (see table). If necessary, adjust speeds as follows:

Start engine and run until warm. Turn A/V control to max.

Idle Speed Adjustment

1 Throttle Solenoid

2 Mounting Screw

Loosen two mounting screws.

3 Governor Arm

4 Carburetor

5 Idle Speed Screw

Pull governor arm away from carburetor and hold while making the following adjustment:

Turn idle speed screw until engine runs at idle speed (see table).

Release governor arm. Place Engine Control switch in Run/Idle position.

6 Carburetor Stop

With solenoid energized, slide solenoid until idle speed screw just touches carburetor stop. Tighten solenoid mounting screws.

7 Governor Arm Extension

Check for smooth operation, and readjust solenoid position if necessary.

Weld/Power Speed Adjustment

Place Engine Control switch in Run position.

8 Weld/Power Speed Rod

9 Locking Nut

Loosen nut.

10 Adjustment Nut

Turn adjustment nut until engine runs at weld/power speed. Tighten locking nut.

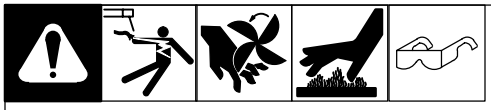
▲ **Stop engine.**

11 Sensitivity Spring

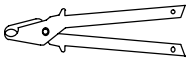
See engine manual for governor sensitivity adjustment.

Ref. ST-801 532-B / ST-800 397

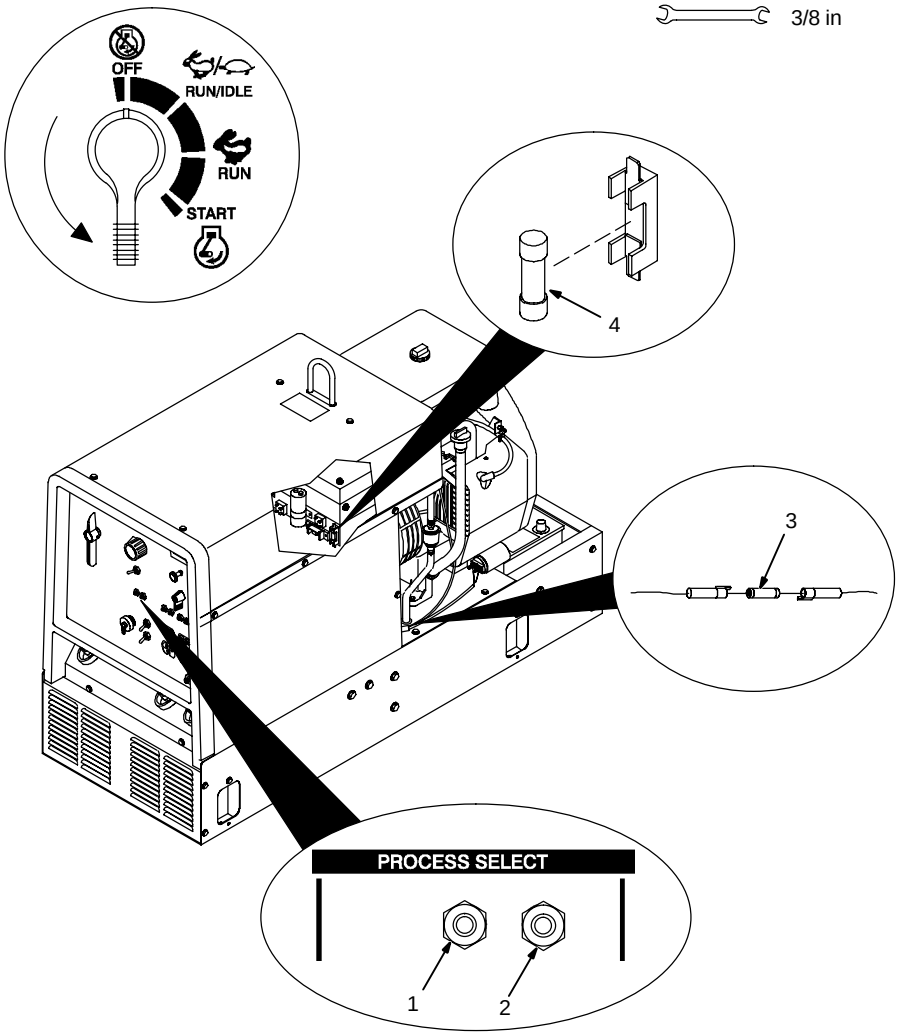
7-7. Overload Protection



Tools Needed:



3/8 in



▲ **Stop engine.**

☞ *If circuit breaker or fuse continues to open, contact Factory Authorized Service Agent.*

1 Circuit Breaker CB1

CB1 protects the 115 volt ac output to Remote 14 receptacle RC1. If CB1 opens, 115 volt ac output to RC1 stops.

2 Circuit Breaker CB2

CB2 protects the 24 volt ac output to Remote 14 receptacle RC1. If CB2 opens, 24 volt ac output to RC1 stops.

Press button to reset breaker.

3 Fuse F6 (See Parts List)

F6 protects the engine wiring system from overload. If F6 opens, engine will not crank.

4 Fuse F1 (See Parts List)

Remove side panel.

F1 protects the exciter excitation winding from overload. If F1 opens, weld and auxiliary power output stops.

Replace any open fuses. Reinstall cover before operating unit.

ST-801 533-C / Ref. ST-180 601-F

7-8. Troubleshooting

A. Welding

Trouble	Remedy
No weld output.	Check control settings.
	Check weld connections.
	Disconnect equipment from auxiliary power receptacles during start-up.
	Place Output (Contactor) switch in On position, or move switch to Remote 14 position and connect remote contactor to Remote 14 receptacle RC1 (see Sections 4-6 and 5-1).
	Check fuse F1, and replace if necessary (see Section 7-7).
	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.

Trouble	Remedy
Low weld output.	Check control settings.
	Place Remote Amperage/Voltage switch in Panel position, or move switch to Remote 14 position and connect remote amperage/voltage control to Remote 14 receptacle RC1.
	Check and clean air cleaner as necessary (see Section 7-3).
	Check and adjust engine speed (see Section 7-6).
	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
	See engine manual.
High weld output.	Check control settings.
	Check and adjust engine speed (see Section 7-6).
	Check for obstructed movement of solenoid linkage (see Section 7-6).
	Have Factory Authorized Service Agent check field current control board PC2.
Weld output cannot be adjusted.	Check position of Remote Amperage/Voltage switch (see Section 5-1).
	Have Factory Authorized Service Agent check field current control board PC2.
Erratic weld output.	Check control settings.
	Clean and tighten connections both inside and outside unit.
	Check and secure lead connections to A/V control.
	Be sure connection to work piece is clean and tight.
	Remove excessive coils from weld cables.
	Use dry, properly stored electrodes.
	Check and adjust engine speed (see Section 7-6).
	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
Remote contactor control does not activate contactor.	Place Output (Contactor) switch in Remote 14 position (see Section 5-1).
	Check and tighten connections to Remote 14 receptacle RC1 (see Section 4-6).
No power output at Remote 14 receptacle RC1.	Reset circuit breaker CB1 and/or CB2 (see Section 7-7).
Lack of high frequency; difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Reduce leakage of high frequency from torch or work cable (check grounding, remove excessive coils from weld cables, use shorter weld cables, etc.).
	Check cables and torch for cracked or deteriorated insulation or bad connections. Repair or replace necessary parts.
Wandering arc – poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten. Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.

B. Auxiliary Power

Trouble	Remedy
No power output.	Reset circuit breakers CB3, CB4, CB5 and/or CB6 (see Section 6-1).
	Check fuse F1, and replace if necessary (see Section 7-7).
	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
Low power output.	Check and clean air cleaner as necessary.
	Check and adjust engine speed (see Section 7-6).
	See engine manual.
High power output.	Check and adjust engine speed (see Section 7-6).
Erratic power output.	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
	Check receptacle wiring and connections.
	Check governor according to engine manual.

C. Engine

Trouble	Remedy
Engine will not crank.	Check fuse F6, and replace if open (see Section 7-7).
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Check plug PLG5 and plug PLG8 connections.
	Have Factory Authorized Service Agent check Engine Control switch S1.
Engine does not start.	Check fuel level (see Section 4-2).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	See engine manual.
Engine starts but stops when Engine Control switch returns to Run position.	Check oil level (see Section 4-2).
	Check and refill crankcase with proper viscosity oil for operating temperature, if necessary (see Section 7-2).
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S2.
Battery discharges between uses.	Clean top of battery with baking soda and water solution; rinse with clear water.
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator according to engine manual.
Engine stopped during normal operation.	Check fuel level (see Section 4-2).
	Check oil level (see Section 4-2).
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S2.
Engine does not return to idle speed.	Be sure Engine Control switch S1 is in Run/Idle position.
	Remove all weld and auxiliary power loads.
	Turn off remote device connected to Remote 14 receptacle RC1 (see Section 4-6).
	Check for obstructed movement of solenoid linkage (see Section 7-6).
	Have Factory Authorized Service Agent check idle module PC1 and current transformer CT1.
Engine does not remain at weld/power speed when power or weld load is applied with Engine Control switch in Run/Idle position.	Place Engine Control switch in the Run position for small loads.

SECTION 8 – ELECTRICAL DIAGRAM

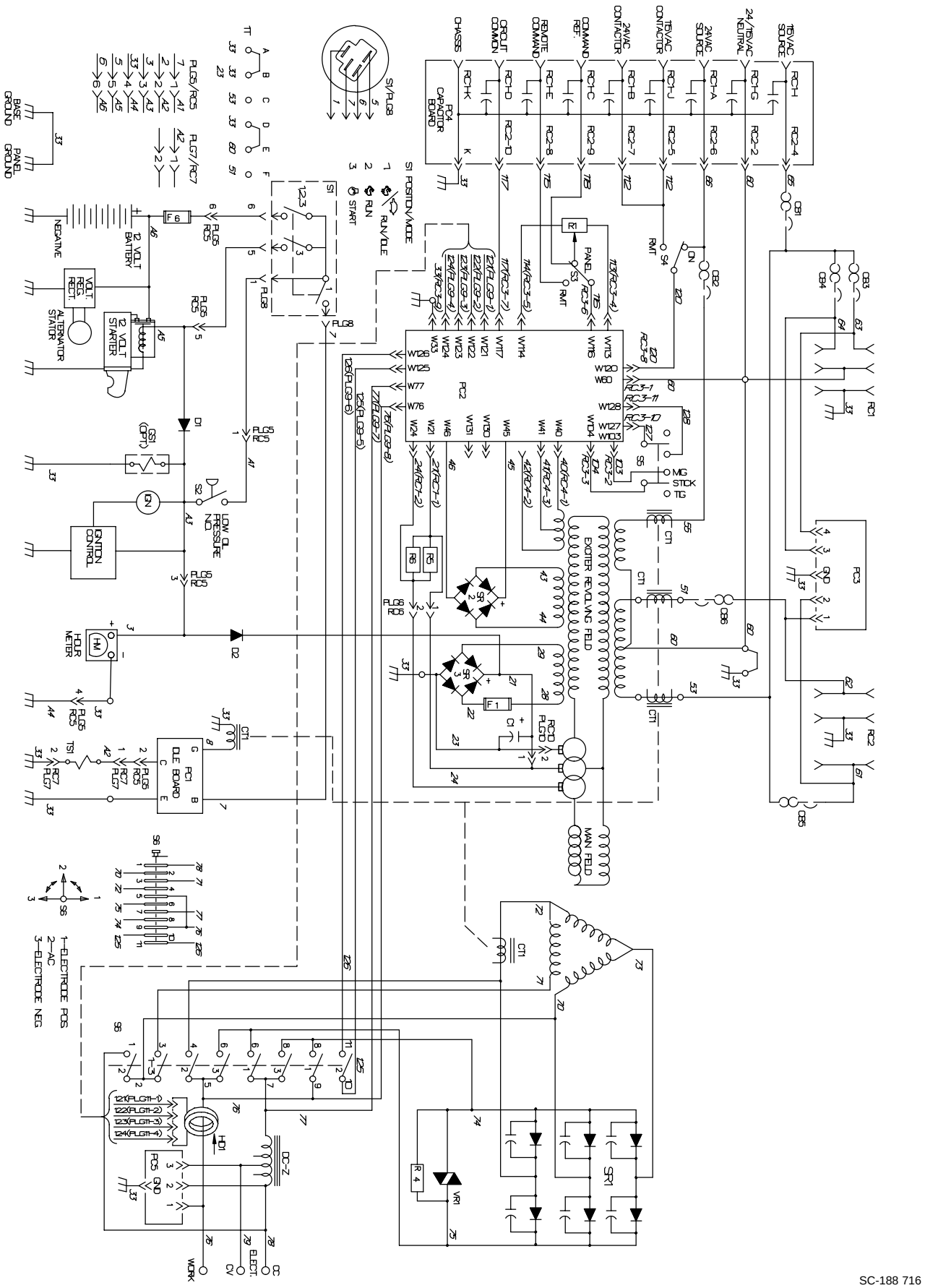
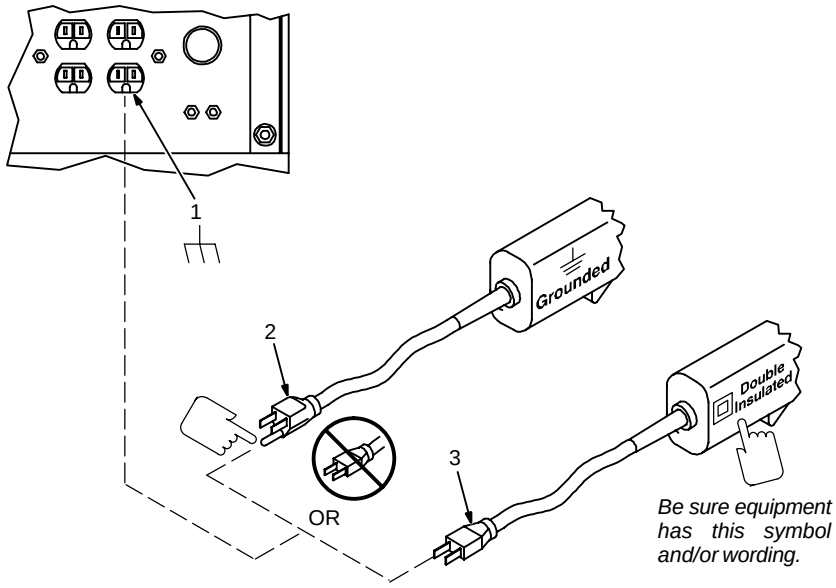


Figure 8-1. Circuit Diagram for Welding Generator

SECTION 9 – AUXILIARY POWER GUIDELINES

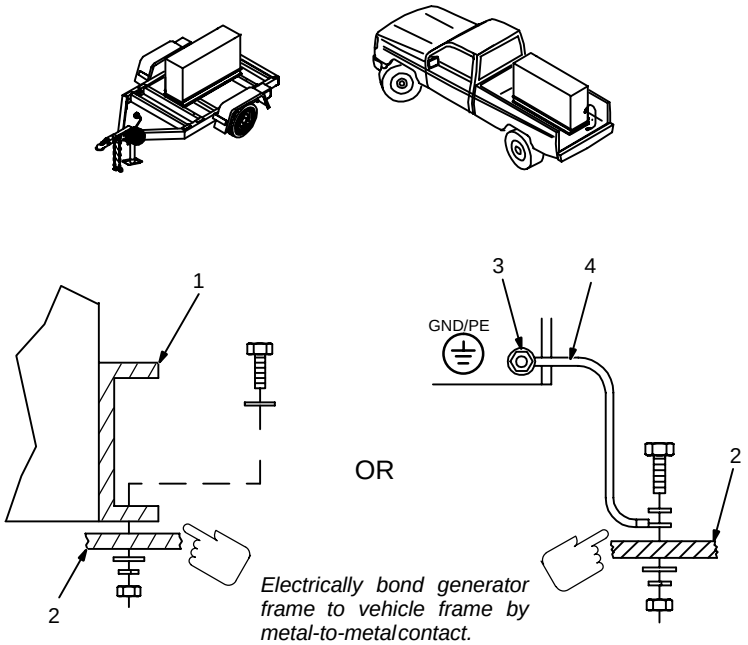
9-1. Selecting Equipment



1 Auxiliary Power Receptacles – Neutral Bonded To Frame
2 3-Prong Plug From Case Grounded Equipment
3 2-Prong Plug From Double Insulated Equipment

aux_pwr 12/96 – Ref. ST-159 730 / ST-800 577

9-2. Grounding Generator To Truck Or Trailer Frame



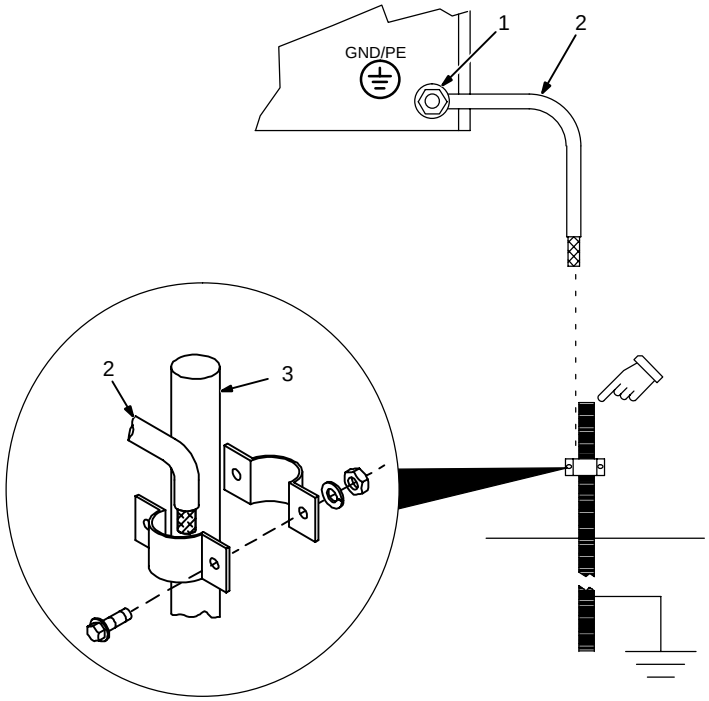
1 Generator Base
2 Metal Vehicle Frame
3 Equipment Grounding Terminal
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

S-0854

9-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #10 AWG or larger insulated copper wire.

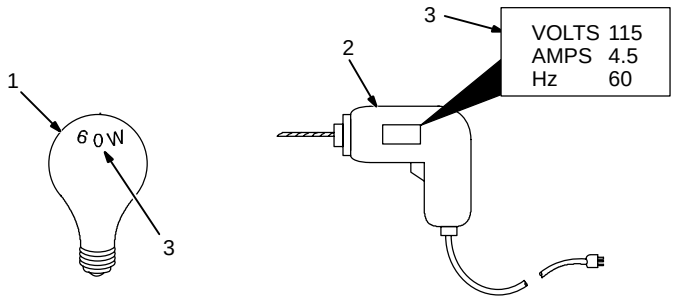
3 Ground Device

▲ **Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.**

Use ground device as stated in electrical codes.

ST-800 576-B

9-4. How Much Power Does Equipment Require?



1 Resistive Load

A light bulb is a resistive load and requires a constant amount of power.

2 Non-Resistive Load

Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 9-8).

3 Rating Data

Rating shows volts and amperes, or watts required to run equipment.

AMPERES x VOLTS = WATTS

EXAMPLE 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

EXAMPLE 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

(200 W + 200 W + 200 W) + 520 W = 1120 W

The total load applied by the three flood lamps and drill is 1120 watts.

S-0623

9-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

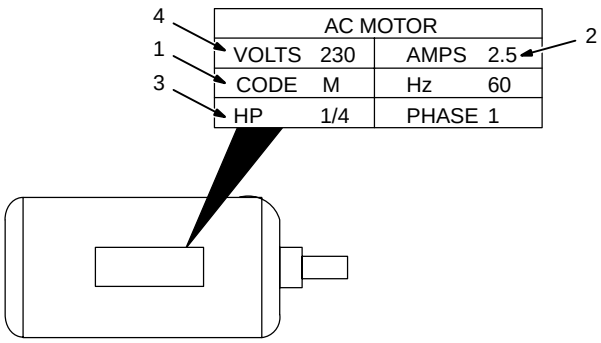
9-6. Approximate Power Requirements For Farm/Home Equipment

Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

9-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

9-8. Power Required To Start Motor



1 Motor Start Code
2 Running Amperage
3 Motor HP
4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

Single-Phase Induction Motor Starting Requirements

Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0

$$\frac{\textbf{kVA/HP x HP x 1000}}{\textbf{VOLTS}} = \textbf{STARTING AMPERAGE}$$

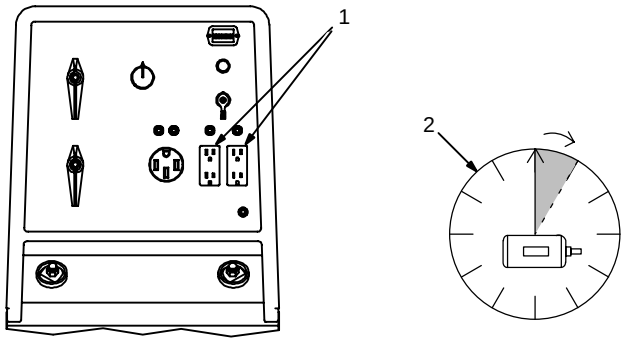
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

Volts = 230 HP = 1/4 Using Table, Code M results in kVA/HP = 11.2

$$\frac{11.2 \times 1/4 \times 1000}{230} = 12.2\ \text{A}$$ **Starting the motor requires 12.2 amperes.**

S-0624

9-9. How Much Power Can Generator Supply?



1 Limit Load To 90% Of Generator Output

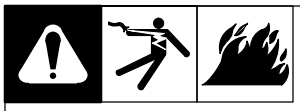
Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

2 5 Second Rule

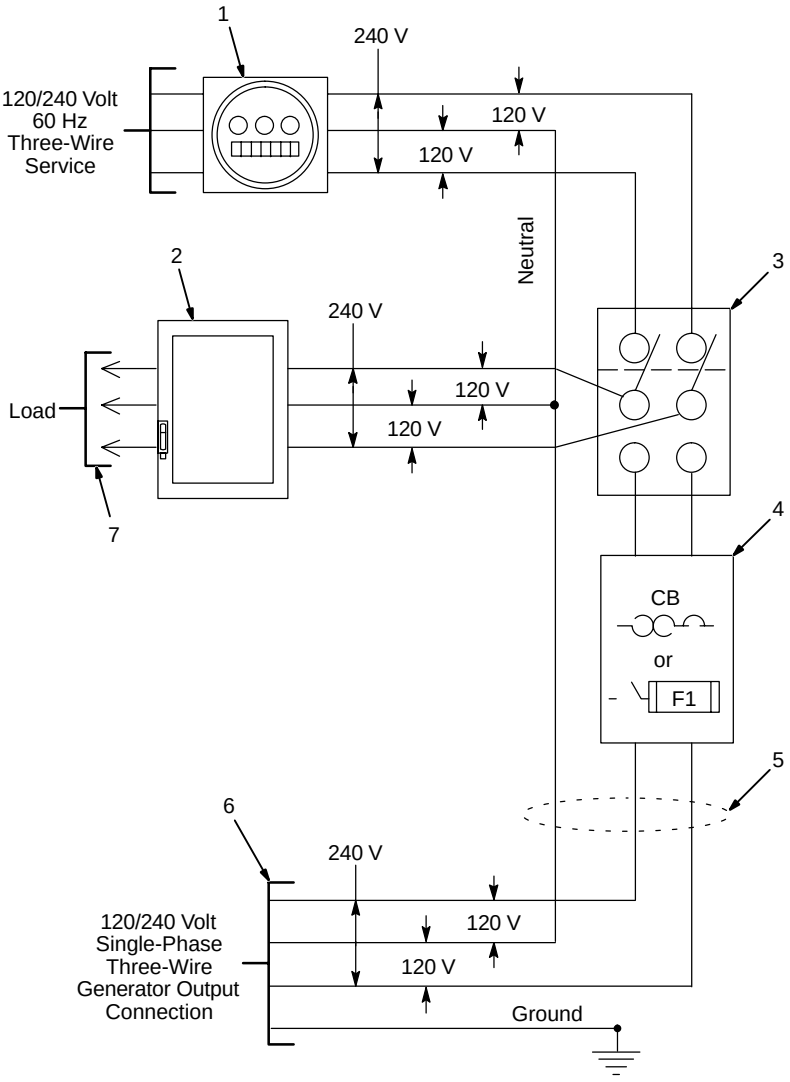
If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

9-10. Typical Connections To Supply Standby Power



☞ *Customer-supplied equipment is required if generator is to supply standby power during emergencies or power outages.*



1 Power Company Service Meter

2 Main and Branch Overcurrent Protection

3 Double-Pole, Double-Throw Transfer Switch

Obtain and install correct switch. Switch rating must be same as or greater than the branch overcurrent protection.

4 Circuit Breakers or Fused Disconnect Switch

Obtain and install correct switch.

5 Extension Cord

Select as shown in Section 9-11.

6 Generator Connections

Connect terminals or plug of adequate amperage capacity to cord. Follow all applicable codes and safety practices.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

7 Load Connections

S-0405-A

9-11. Selecting Extension Cord (Use Shortest Cord Possible)

Cord Lengths for 120 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

Cord Lengths for 240 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop

☞ *Hardware is common and not available unless listed.*

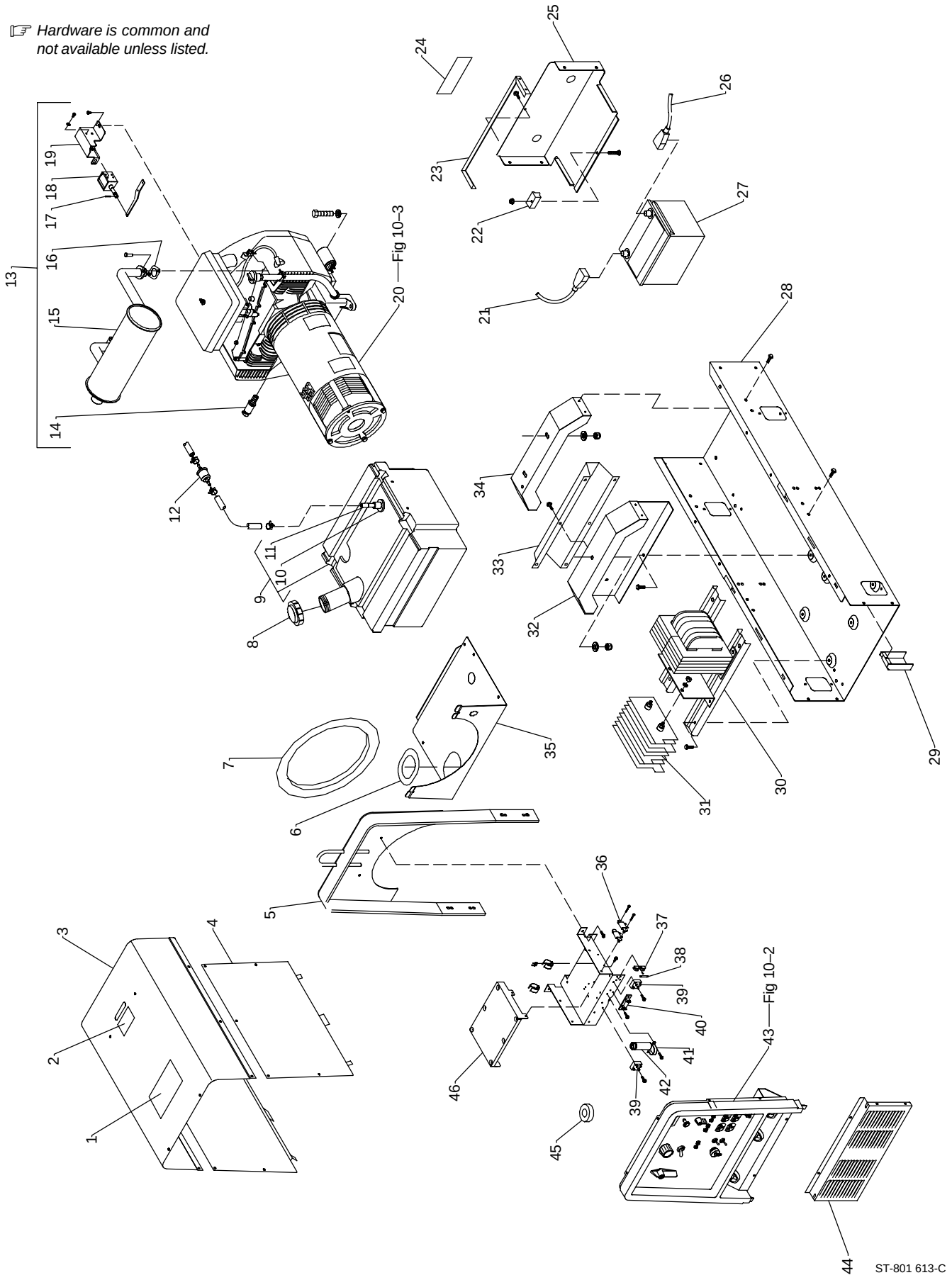


Figure 10-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 10-1. Main Assembly	
1		182 761	LABEL, general precautionary engine drive	1
2		108 487	LABEL, warning falling equipment etc	1
3		+159 907	COVER, top	1
3		+♦169 441	COVER, top	1
4		169 329	PANEL, side	2
4		♦169 442	PANEL, side	2
5		159 914	UPRIGHT, base	1
6		168 640	SEAL, filler neck fuel tank	1
7		181 789	SEAL, barrel	1
8		147 601	CAP, tank screw-on	1
9		178 498	TANK, fuel 8.5gal (consisting of)	1
10		124 253	BUSHING, tank fuel	1
11		178 632	FITTING, stand pipe	1
12		121 652	FILTER KIT, fuel w/clamps	1
	PLG5		CONNECTOR, (Part of engine harness)	1
	RC5	116 045	CONNECTOR & PINS	1
	F6	021 718	FUSE, mintr gl 30A 32V	1
13		178 487	ENGINE, gas (consisting of)	1
14		165 271	VALVE, oil drain 3/8-18NPTF	1
15		164 353	MUFFLER, exhaust engine	1
16		065 313	MUFFLER GASKET	2
17		059 926	PIN, spring CS .093 x 1.000	1
18	TS1	165 810	SOLENOID, 14VDC .53A	1
19		165 522	BRACKET, mtg solenoid	1
		137 046	TUNE-UP & FILTER KIT, (consisting of)	1
		064 617	ELEMENT, air cleaner	1
		065 251	OIL FILTER	1
		121 652	FILTER/CLAMPS, fuel	1
		065 709	SPARK PLUG	2
20		Fig 10-3	GENERATOR	1
21		167 730	CABLE, battery neg 29.00 lg	1
		165 600	CABLE, battery neg 18.50 lg	1
22		182 935	HOLD DOWN, battery	1
23		186 896	BRACKET, battery tray support	1
24		168 385	LABEL, warning battery explosion can blind	1
25		+182 897	DOOR, access bat	1
26		167 731	CABLE, bat pos 19.500 lg (included w/engine)	1
27	Batt	168 037	BATTERY, stor 12V 415crk 95rsv GP58 dry	1
28		+182 845	BASE	1
29		181 057	COVER, base	4
30	DC-Z	181 551	STABILIZER ASSEMBLY, (consisting of)	1
		180 622	STABILIZER	1
		180 625	BRACKET, mtg rectifier	1
		164 920	BRACKET, mtg stab/reactor	2
31	SR1	183 051	RECTIFIER, si 3ph 300A	1
32		182 928	BRACKET, mtg generator	1
33		186 741	SPACER, fuel tank	1
34		159 905	BRACKET, mtg engine	1
35		178 497	PANEL, rear lower	1
36	R5,6	139 812	RESISTOR, WW fxd 30W 5K	2
37		172 731	HOLDER, fuse mintr	1
38	F1,2	*012 655	FUSE, mintr cer 10A 250V	2
39	SR2,3	035 704	RECTIFIER, integ 40A 800V	2
40	D2	135 184	DIODE, board	1
41		177 136	CLAMP, capacitor	2
42	C1	156 289	CAPACITOR, elctlt 240uf 250VDC	1
43		Fig 10-2	PANEL, front w/components	1
44		180 628	PANEL, lower front	1
45	CT1	179 494	TRANSFORMER, current sensing	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-1. Main Assembly (Continued)

. . . 46	PC2 . . .	188 155 . .	CIRCUIT CARD ASSEMBLY, field current controller	1
. . . . .	PLG1 . . .	174 823 . .	CONNECTOR & SOCKETS	1
. . . . .	RC3 . . .	147 663 . .	CONNECTOR & PINS	1
. . . . .	RC4 . . .	168 165 . .	CONNECTOR & PINS	1
. . . . .	RC9 . . .	168 071 . .	CONNECTOR & PINS	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
♦For Optional 043 051 Stainless Steel Dress Up Kit.
*Recommended Spare Parts.
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

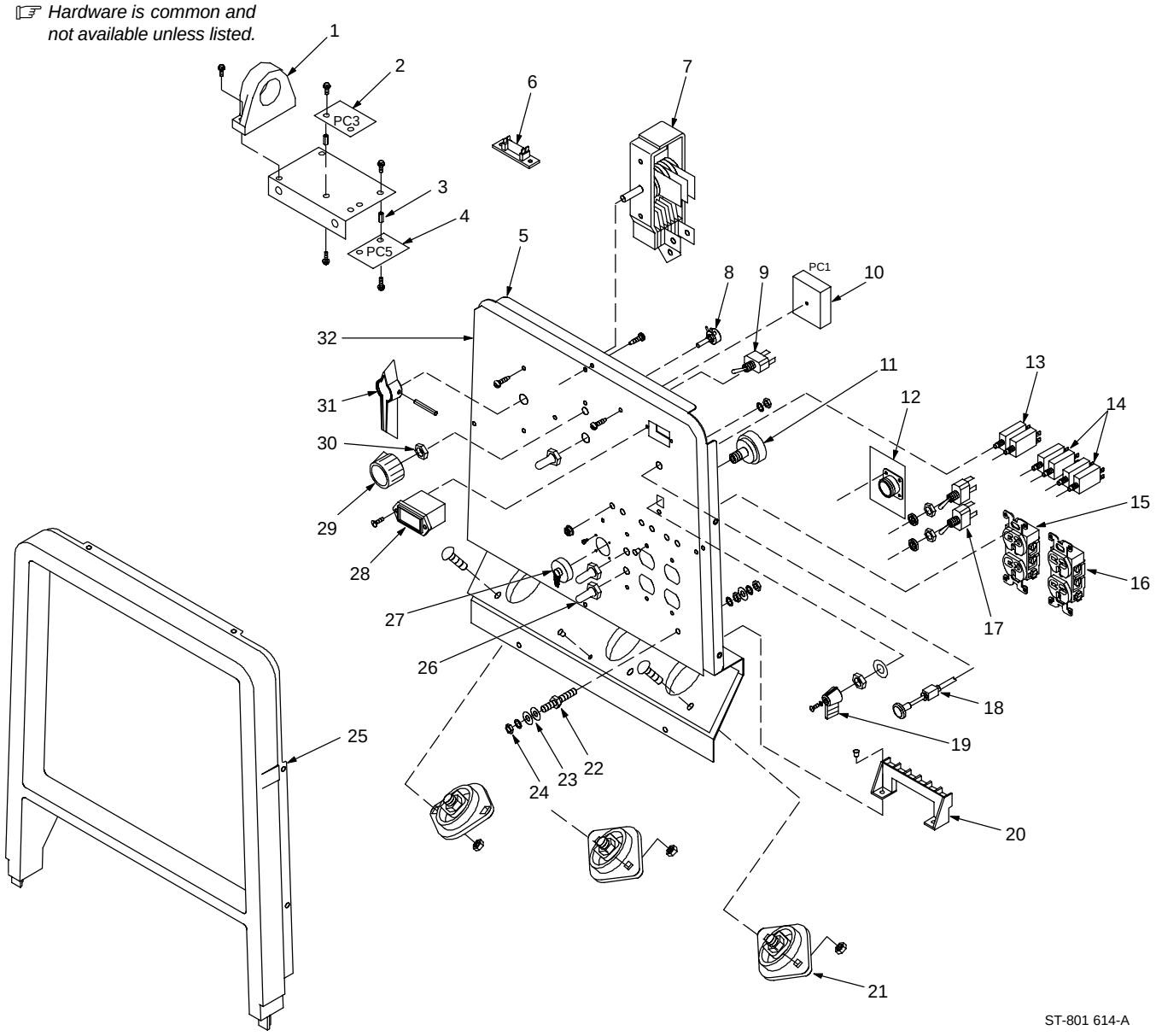


Figure 10-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-2. Panel, Front w/Components (Fig 10-1 Item 43)

1	HD1	168 829	TRANSDUCER, current 1000A module max open loop	1
2	PC3	148 021	CIRCUIT CARD, filter HF	1
3		073 756	STAND OFF, 6-32 x .625 lg	4
4	PC5	148 030	CIRCUIT CARD, filter HF	1
5		185 161	PANEL, front	1
6	VR1	046 819	SUPPRESSOR	1
7	S6	180 606	SWITCH, changeover	1
8	R1	072 623	POTENTIOMETER	1
9	S5	088 409	SWITCH, toggle DPDT 15A 125VAC	1
10	PC1	184 731	MODULE, pull to idle 5 pin	1
11	S1	176 606	SWITCH, ign 4posn	1
12	PC4	147 554	CIRCUIT CARD ASSEMBLY, connector/receptacle	1
	PLG2	165 668	CONNECTOR & PINS	1
13	CB1,2	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	2
14	CB3-6	093 995	CIRCUIT BREAKER, man reset 1P 15A 250V	4
15	RC1	604 176	RECEPTACLE, str dx grd 2P3W 15A 125V	1
		073 690	PLUG, 2P3W 15A 125V	
16	RC2	604 103	RECEPTACLE, str dx grd 2P3W 15A 250V	1
		025 234	PLUG, 2P3W 15A 250V	
17	S3,4	011 609	SWITCH, tgl SPDT 15A 125V	2
18		182 870	CONTROL, push pull	1
19		119 014	LEVER, switch black	1
20	1T	172 661	BLOCK, stud connection 6posn (consisting of)	1
		173 734	JUMPER LINK	2
21		099 255	TERMINAL, pwr output	3
22		083 030	STUD, brs .250-20 x 1.750	1
23		010 915	WASHER, flat brs .250	2
24		601 836	NUT, brs hex jam .250-20	3
25		159 921	BEZEL	1
26		021 385	BOOT, toggle switch lever	3
27		170 391	CAP, dust connector 9760-20 protector	1
28	HM	145 247	METER, hour 10-32VDC	1
29		097 924	KNOB, pointer	1
30		072 590	LOCK, shaft .375-32 x .250dia shaft	1
31		115 493	HANDLE, range switch	1
32			NAMEPLATE, (order by model and serial number)	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-3. Generator (Fig 10-1 Item 20)

1		182 091	LABEL, warning fuel/fan	1
2		182 092	LABEL, warning moving parts can cause serious injury	3
3		+180 619	SHROUD, generator	1
4		+180 618	STATOR	1
5		107 313	BAFFLE, air	1
6		180 702	ROTOR ASSEMBLY, (consisting of)	1
7		024 617	RING, retaining external	1
8		053 390	BEARING, ball	1
9		107 417	FAN, rotor	1
10		017 702	ADAPTER, engine	1
11		134 981	ADAPTER, fan rotor	1
12		007 250	BRACKET, mtg brushholder	1
13		047 878	BAR, retaining brushholder	1
14		161 306	CAP, brushholder	3
15		*126 984	BRUSH, w/spring	3
16		005 614	HOLDER, brush	3
17		153 297	ENDBELL, (consisting of)	1
18		143 220	O-RING, 2.859 ID x .139CS	1
19	2T,3T	072 253	STUD, connection single	2

☞ *Hardware is common and not available unless listed.*

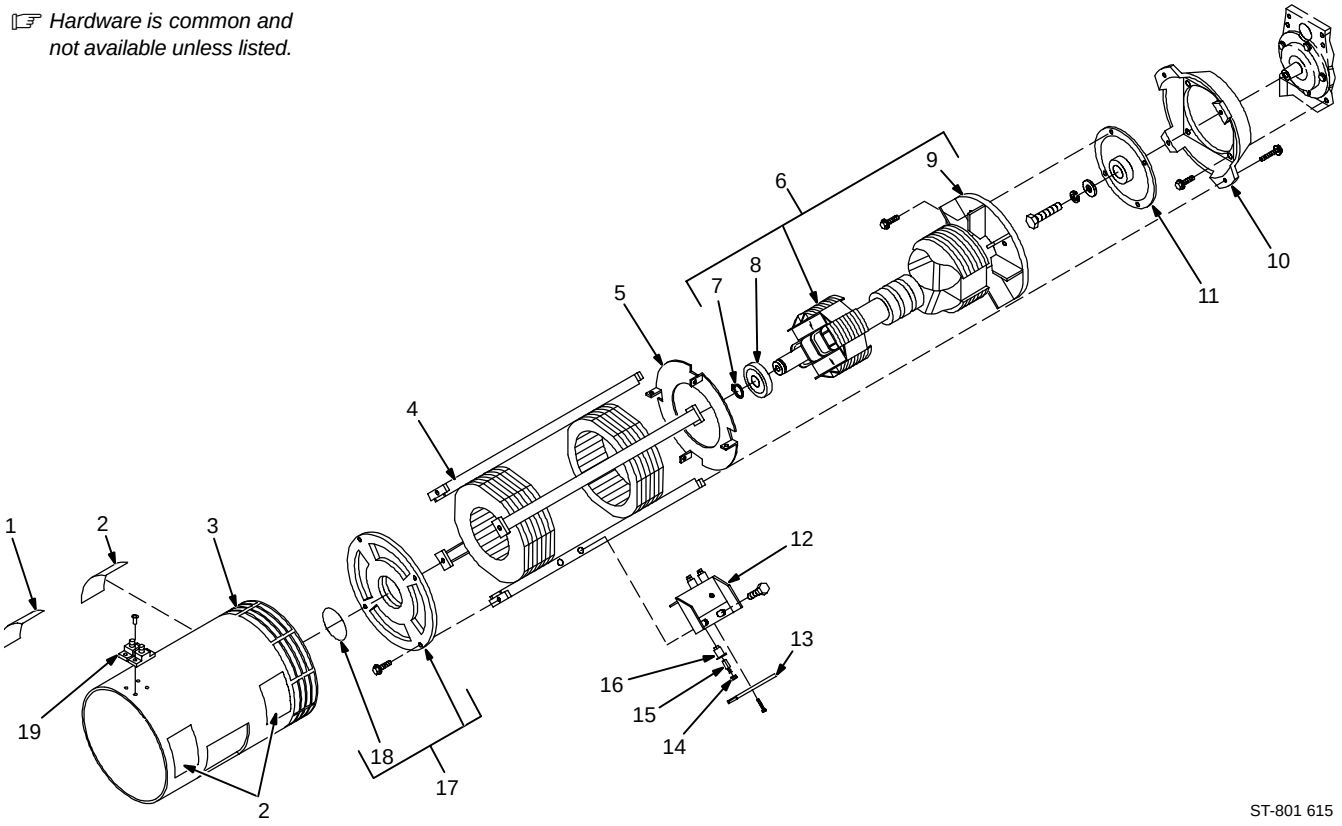


Figure 10-3. Generator

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller
The Power of Blue.

TRUE BLUE® WARRANTY

Effective January 1, 2000
(Equipment with a serial number preface of "LA" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185 & Spoolmate 250
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

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Owner's Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip

For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables
	Options and Accessories
	Personal Safety Equipment
	Service and Repair
	Replacement Parts
	Training (Schools, Videos, Books)
	Technical Manuals (Servicing Information and Parts)
	Circuit Diagrams
	Welding Process Handbooks
Contact the Delivering Carrier for:	File a claim for loss or damage during shipment.
For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	

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